

I would appreciate your  
suggestions and  
feedback on this  
manuscript

Thanks,      Bob Horn

# Nuclear

# Dilemmas

*Paradoxes, Contradictions and  
Predcaments of Nuclear S strategy  
in the Cold War*

by  
**Robert E. Horn**  
*hornbob@earthlink.net*



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# Introduction to This Nuclear Dilemmas Manuscript

DRAFT of Manuscript June 1987  
New Introduction drafted June, 2024

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## What is this?

This is an unfinished manuscript. It is an incomplete exploration written 1986 and 1987, during the Cold War. This introduction is written in 2024.

The manuscript consists of over 100 visual diagrams that ask:

- What if we tried to diagram the dilemmas of nuclear deterrence?
- Of what use might a group of those diagrams be to strategists and to the ordinary public?

I am making it available in its current condition, because I think it might be of use to others who might find it useful to continue the analyses and presentations I have attempted.

## Context

When I first started studying deterrence in nuclear war in a more serious way, I found many books by nuclear experts which described contradictions, paradoxes and dilemmas nuclear strategy. Often early in their books I would read something like: "Of course, there is a Catch 22 here..." and a hundred pages later, the author would *not have referred further to this dilemma*. And not just a single strategist. I had a whole shelf of their books each with *different dilemmas* of nuclear deterrence, and rarely were dilemmas incorporated into their conclusions. Despite all the contradictions in dilemmas, they implied that deterrence had worked, and would continue to be the only possible national strategy for nuclear affairs.

## Limits to thinking when addressing the dilemmas

Not every strategist simply moved on after noting the Catch 22 dilemmas. Robert Jervis, a professor of international relations at Columbia University, wrote an entire book, *The Illogic of American Nuclear Policy*, that directly addressed the limits that these contradictions and dilemmas imposed. He wrote: "A rational strategy for the employment of nuclear weapons is a contradiction in terms. The enormous destructive power of these weapons creates insoluble problems. For this reason, much of the history of nuclear strategy has been a series of attempts to find a way out of this predicament and return to the simpler, more comforting pre-nuclear world in which safety did not depend on the adversary's restraint."

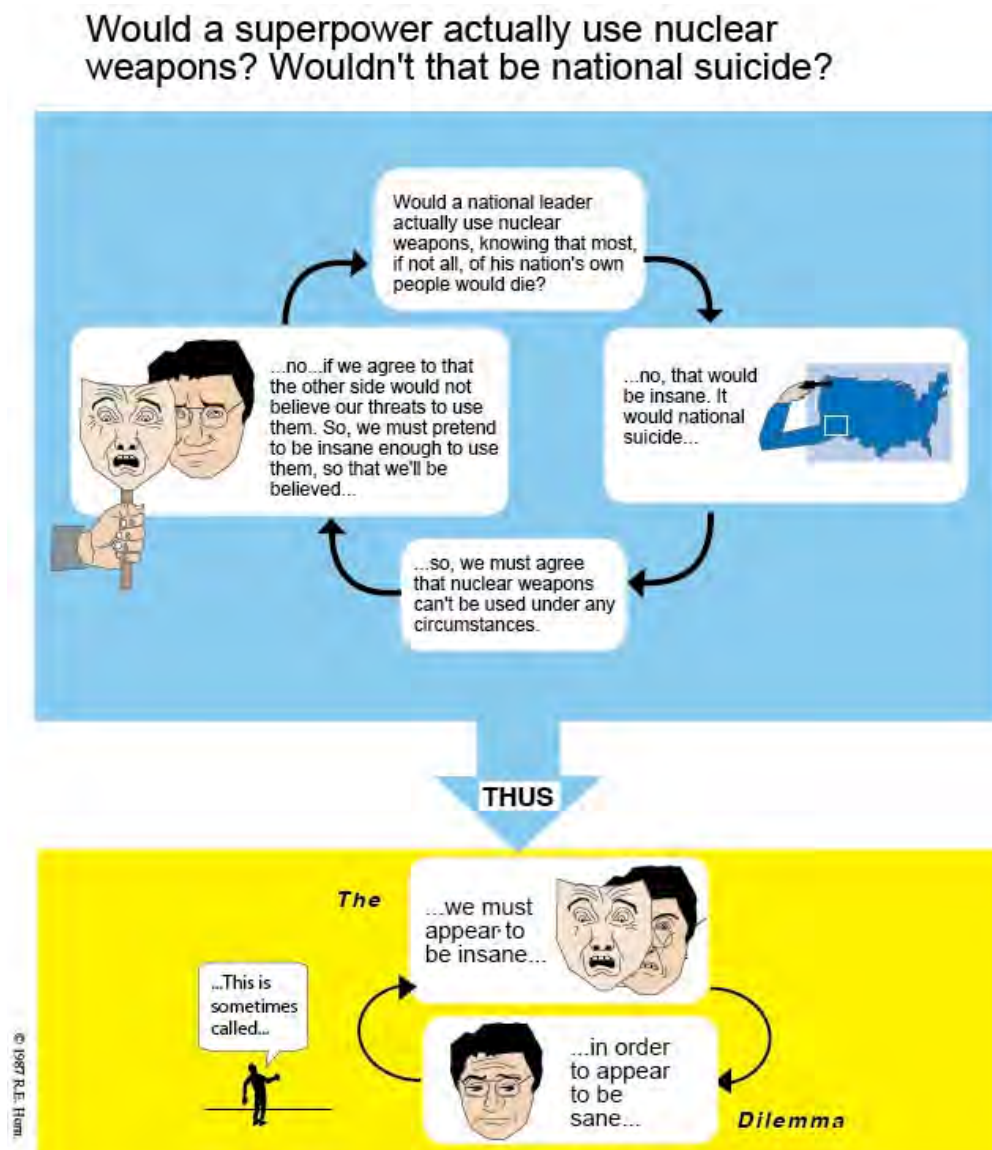
Many of my sources would conclude as Ambassador George F. Kennan did: "To my mind, the nuclear bomb is the most useless weapon ever invented. It can be employed to no constructive purpose. It is not even an effective defense against itself." And Robert S. McNamara, "Having spent seven years as Secretary of Defense . . . I do not believe we can avoid serious and unacceptable risk of nuclear war until we recognize . . . that nuclear weapons serve no military purpose whatsoever. They are totally useless – except only to deter one's opponent from using them."

## Make diagrams of the dilemmas

To see if I was missing something, I started making diagrams to follow the expert's arguments. Why diagrams? At the time I was something of an expert in diagramming and had found that frequently simply changing the format and presentation helps change how we think about things.

As I worked through the paradoxes and dilemmas, the diagrams frequently turned out to be *curious loops* that were intended to represent how the arguments come back upon themselves and contradict previous fundamental assertions. I found the diagrams of contradictions and dilemmas often could be represented as loops.

Here is one example.



## **My early personal history with a nuclear war game**

### **Why was I absorbed in the topic of nuclear weapons and war?**

In 1945, as a 12 year old, I first learned about the atomic bomb from the radio and newspapers. Just out of a final semester in Washington DC for a BA in political science, I was a 22 year-old draftee Army private during the Korean War.

From October 31 to December 15 1955, along with over 100,000 other soldiers, I was sent to Fort Polk Louisiana to participate in the first tactical nuclear weapons war game called Operation Sagebrush. I was on the USA side. The enemy was invading Louisiana from the Gulf of Mexico. Both sides had newly invented tactical nuclear weapons.

### **My role: plot the explosions of nuclear weapons**

I was assigned for 12 hours a day, usually at night, to stand by a large sand table map representing the entire battlefield and answer the phone when the umpires called. Typically, the umpire would give me the coordinates where a tactical nuclear weapon shot by the other side had landed. My job was to indicate on the map exactly where the nuke had exploded.

I worked as a clerk in a military police battalion. The reason I was doing this map work was that the military police had to know where the nukes had exploded so they could direct traffic around that area. After each phone call I would take a marker are about the size of a salt shaker and place it on the coordinates on the map table.

### **Killed and reincarnated twice**

I was killed twice (simulated by a yellow tag around my neck) and put it on the truck and sent to a replacement center with the other troops that were killed. There I was reincarnated twice (simulated) and sent back to my military police unit to replace myself.

After six weeks we were told to pack up our things and go back to Fort Hood Texas which was our permanent base.

### **A few more details on the Operation Sagebrush war game**

Bracken, Paul in *The Command and Control of Nuclear Forces* (1983) noted that the wargame, “involved four complete Army divisions, approximately 100 thousand troops. Army forces simulated nuclear strikes totaling approximately 19,000 kilotons, ranging from 2 kiloton atomic demolition munitions to 200 kiloton Corporal missile strikes. The Air Force simulated weapons with yields up to 500 kilotons. Umpires ruled the strikes would have resulted in 20,000 casualties and destroyed 2700 Army vehicles. The exercise after action report noted, ‘[It] should be apparent that concentration of atomic means against targets of these kinds [headquarters, logistic units, artillery units] would soon render infantry and armored units without adequate logistics support, fire support, and command coordination. Infantry and armored units in this situation would appear unable to avoid destruction in detail when faced by enemy forces’. (p.161)



Writing 40 some years after Sagebrush, Lawrence Freedman says in his book *The Evolution Of Nuclear Strategy* (2003): “Operation Sagebrush, a war game in Louisiana (the size of Greece and Portugal) in which after 70 bombs each of not more than 40 kt yield had been dropped on military targets, the umpires ruled that all life in the state had ‘ceased to exist.’

**There I was...only eight months after graduating with a political science minor...having my first (simulated) experience with nuclear weapons!**

**How could I *not* somehow follow nuclear weapons all my life?**

### **Diagram the thought processes of deterrence**

The dilemmas I have illustrated in this manuscript, I found in the books of the experts on nuclear strategy. I decided to try out a format of writing a question they had asked or implied, and then attempting to diagram, in some way, the sentence or sentences that constituted what I found to be the answer to the question in the literature, provided by the experts in nuclear war and nuclear weapons.

Repeatedly, as I read further and deeper, there were a large number of paradoxes, contradictions, and dilemmas that attracted my attention.

#### **What this manuscript is *not***

This manuscript is not about many other aspects of the nuclear weapons mess, such as the million-year problem of getting rid of the high-level waste. It is not about non-proliferation. It is not about technical aspects of weapons construction and delivery systems. It is not about specific targeting plans. It is not about which countries have nuclear weapons. My main focus is on thinking about deterrence and its implications.

#### **What to do with the results?**

At the present moment, I don't have any good methodology for taking these dilemma diagrams forward. The best I can do when I have time is to continue working on carefully laying them out.

Of course, it is important for our decision makers to be realizing how tangled the logic and thinking is involved in the concept of deterrence. That is the main reason for making this manuscript available.

#### **Status of the diagrams in the draft manuscript**

Some of the diagrams are incomplete and others that need improvement. For the time being, I have decided not to work on them, but rather to make the entire manuscript available for others to work on. And to perhaps, collaborate with others to push this analysis further.

## Some Conclusions

### What have I learned from this exercise?

My conclusions are quite different from the typical authoritative conclusions of many deterrence theorists I read. Diagrams, frequently enable us to examine our thinking more carefully. I hope that I have shown one way to move analysis forward with diagramming.

### Loopy diagrams have impact

I have come to believe that the diagrams – the loopy ones – somehow convey a higher impact than the conventional text versions of the dilemmas in the books in which I found them. The loop diagram device helped me understand how what was being argued had met some limits to thinking. I hope that it helps you as well.

### Deterrence concept is not a simple linear sentence

What the visual diagrams provide is a reminder that deterrence concept is not a simple linear process in a sentence or a few sentences following one another. It reminds you that you are in a tangled network of thoughts. One could assemble some of the individual dilemma diagrams into larger networks. What would that show?

### Unresolved weighing of the alternatives

We often have no amount of evidence or convincing reasoning to resolve our unresolved weighing of the alternatives. This leaves dilemmas in a kind of up-in-the-air, unresolved situation.

### More to be learned

I conclude that it is very difficult to untangle the logic portrayed and to know if one has completely diagrammed all the logical sequences and pathways, and if one has put them together in a useful way. We have much to learn as a civilization in dealing with and thinking about nuclear conflict.

But it *is* important to note that we are *not playing* with language here in some sort of academic debate. *We are examining the reasoning on what our very lives depend.*

## References

NOTE. A partial list of the sources consulted for this manuscript is located at the end of the entire document.

Bracken, Paul (1983) *The Command and Control of Nuclear Forces*, Yale Univ. Press.

Jervis, Robert (1985) , *The Illogic of American Nuclear Policy*, Cornell Univ. Press

Lawrence Freedman, (2003) *The Evolution of Nuclear Strategy* 3d ed, Palgrave.

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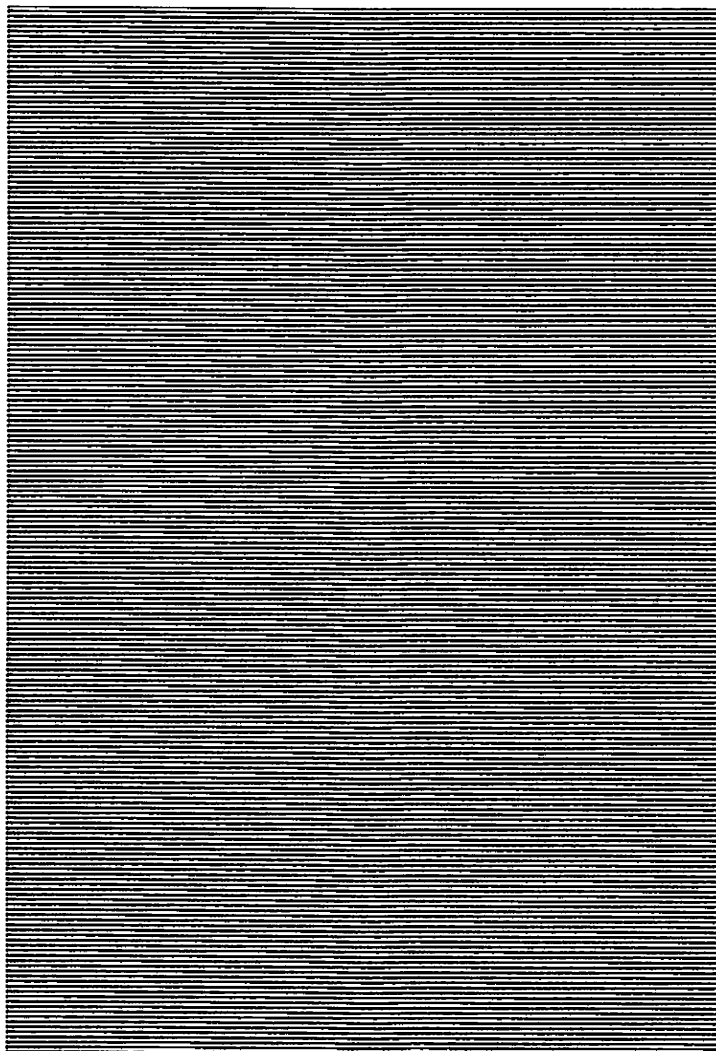


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*The decline of faith*

### Part B. Looking at Possible Policies

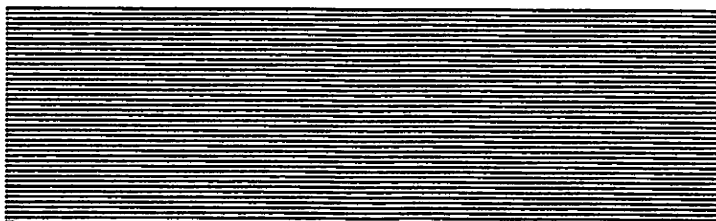
*Potential Dangers, Potential Benefits*

### Part C. Looking at the Dynamics

*The Complicating Factors*

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### **Part A. Looking at Deterrence**

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- Chapter 9. Perceptions

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- Chapter 10. Risks and Choices



## Preface

The following essay results from my effort to become an informed citizen who could understand nuclear weapons and how they might be used.



The more I read, the more difficulty I had following the logic. There were apparent contradictions and openly acknowledged paradoxes. I would read "Of course, there is a Catch 22 here..." and a hundred pages later, the author would not have referred further to this dilemma. Many policies were suggested with acknowledgement of rebtals and, hence, no rebuttals of the rebuttals.



To see if I was missing something, I started making diagrams to follow the arguments. Frequently these diagrams consisted of loops that are intended to represent how the arguments come back upon themselves or rationales for how policies contradicted themselves. In addition I found it useful to try to make the pre-requisites for understanding this thinking as visual as possible. These devices helped me understand what was being debated. I hope that they help you as well.

*Robert E. Horn  
The Lexington Institute*



## Pre-Review of Thinking About the Nuclear Dilemma

This is an unusual book. Its topic--what to do about nuclear weapons--has been covered by many volumes in recent years. But this book's treatment of these subject is unique in several ways. The most obvious of the differences is that this is a *visual* book, not visual in the ordinary sense of tacking on some photos, illustrations, or diagrams onto a text. But visual in the sense that the words and images are thoroughly integrated. There is no place where there is pure text. There are no isolated pictures. That in itself gives us a different "take" on the subject.

The subject matter will be familiar to the scholar, but the book is written for intelligent laypersons who wants to themselves of the major arguments and dynamics of nuclear matters. The first part provides an introduction to the basic concepts of nuclear weapons and the concept of deterrence--all presented visually-- that has served as the cornerstone of strategic thinking for the past 40 years. It examines why deterrence has come to be doubted by various groups and then the the second part examines the major policies that have been advanced to get out of the dilemmas of the weapons and deterrence erosion. This section is interesting in how it presents the major arguments, their rebuttals, and the rebuttals of the rebuttals in such a compact, clear and cohesive manner. Perhaps no other single document covers this territory with such clarity and level of detail. The third part is called "Looking at the Dynamics" and presents us with a variety of loop-like diagrams that drive the thinking behind the policies. These are where the traps lie for statesmen and strategists. While other such as Jervis (in *The Illogic of American Strategic Nuclear Policy*) have written about some of these dynamics, no other place collects them together with such impact. The final chapter ties together the whole subject in terms of sets of choices that the people of the two superpowers and their leaders will have to make in the coming decade.

Throughout the book there is an critique of illogical thinking about nuclear deterrence, which to its credit does not resort to simplistic syllogistic analysis. Rather, having shown the untenable nature of the existing arguments, the book requires that scholars, strategic thinkers and laypersons will have to move to a higher level of discourse.

The treatment of the subject by this book is different in many significant ways. It focuses on the thinking processes that strategists and statesmen, generals and polticians have used to get us into the most dangerous situation the human species has ever faced. Here there are two innovations. One is the presentation of all of the dilemmas, contradictions, and paradoxes of nuclear thinking as visual loops--to portray thought that comes back upon itself. We find many of these in nuclear writings. But they are acknowledged and for the most part ignored. The second innovation might also be called a restoration. In the age of television, too much of public debate is what has been called "bumper sticker thinking." It makes an assertion at the audience without recognizing that other points of view have rebutted these arguments and that rebuttals of their rebuttals give the listener a better view of the discussion as a whole. One has only to look at the *Federalist Papers* in our own history to see how the level of our present public discourse has declined. This book goes some distance in its presentation of competing possible policies and the rebuttals to these policies and the rebuttals of the rebuttals.

Another striking element of the book is its elegant sparseness. The flow charts and loop diagrams the author presents give only the essence of the arguments. He does not elaborate, although he does provide an adequate level of detail. The effect is to allow the main shape of the argument to stand out in bold relief for our consideration. At times the diagramed arguments have a kind of poetic flow. This reviewer encourages you to read some of the flow charts out loud to get a feel for the prose style that is incorporated into this novel exposition. I wouldn't be surprise if we saw an audio tape produced with various readers chanting these arguments to the internal rhythms of the prose.

Some will criticize the book for its "cleverness". In places the author has perhaps streteched a point. But the loops (such as the "we must appear to be insane in order to appear to be sane" loop) are not his. Almost all have been gathered from the military and academic literature as the thorough footnotes attest. But the author may be pardoned for an occasional rhetoical excess, because his intense scrutiny of the loops of nuclear thinking are a contribution to the debate at the *meta-level*. Here one thinks of its similarity to Hofstadter's *Godel, Escher, Bach*, which changed the context for many philosophical issues by its close examination of recursive thinking and deeply tangled



hierarchies, related ideas to this book's loops.

For many of the arguments, the author has chosen to couch the words in a distinctive "we-they" format. Thus we read \_\_\_\_\_. And as I read passages like this I began to notice that I identified with the "we" in the argument. But I also noticed that if the book were translated into Russian the reader could identify with the "we" in many cases! The arguments are symmetrical...you can't really tell who is "us" and who is "them" in some of the most critical assertions having to do with nuclear strategy.

This "us-them" system is one of the focal points of the book. It focuses on how our thinking is part of a larger system of thinking. We sometimes think the entire argument is contained in a single head--our own. We often fail to see how our arguments affect the thinking of others--especially of the "other side" and how their thinking affects our thinking. As a result, this is a book that is deeply cybernetic. It attempts to elucidate how thought systems interact. In this way it stands out from other books that we have seen. It does not let us remain in our comfortable traditional "logical" positions. It shows them for what they are: fragments of on-going thinking processes. The human race has only begun to understand the complexity of the invisible dynamic webs of thought in which it is entangled. The most dangerous of these are the threat-counterthreat, force-counterforce, fear-counterfear webs in which the modern nation state system entangles us all. We have no choice, says the common wisdom of statesmen, but counterthreat when we are threatened. Force must be met with force. Capabilities threaten, even when leaders restrain their rhetoric. We are indeed spiders caught in our own mutual webs.

Is there another way? This book says we must first look at our thinking. We must look at how we think. We must look at the contradictions, Catch 22's, and paradoxes square in the face. No easy answers are here. The author does not present a solution. That is too much to ask of a book like this. It is enough that it lets us see our predicament from a variety of other angles, angles that are fresh and provide suggestive ways in which to proceed. One way, it suggests, is to discuss with "them" the "us-them" cybernetic loops in which we are both trapped.

This book, in addition, serves as a rich repository that scholar and lay person alike will want to consult. But it is not burdened with heavy prose or academic base-touching. More than anything, this is a book we can -- and should -- read.

## Negative Pre-Review

As many critics has pointed out, literacy is declining in the U.S. This book is some kind of pacesetter in this trend. Here we have a book on arguably the most important issue of our time. It is done in a kind of cutsy artistic style, loaded with spaghetti like flow charts and perfectly awful drawings. It combines the worst features of the college outline series which we all used to cram for exam, the comic book and trivial pursuits, and the 1952 edition of the world almanac. One wonders how the author misspent his youth--reading Capt. Marvel comic books, no doubt.

Who does Horn think he is? An expert? Not from looking at this book. He has managed to collect a bunch of facts and arguments, nor from the presentation. This book, Nuclear Dilemmas, is advertised as preseting nuclear strategy for the intelligent layperson. There is a fine line between simplicity and simplistic, and Horn has crossed it, for the worse, I might say.

Clearly the author has aspirations, and delusions of grandeur. Despite some effort to remain objective, the author's ultra-liberal bias shines through. Neither hawk nor dove nor owl would fly anywhere near this book.

The book is long. Far too much detail is given to make elementary points. Other arguments are presented in the barest of outline, even though they represent some of the most important decisions that are made on the planet. It hard to conceive of a book that is so excessively out of balance.

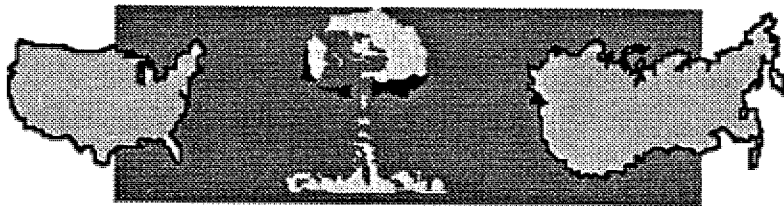
Under the guise of "new visual formats" the author has made reading excessively difficult, especially for the primer level at which the arguments are developed. Will we ever see the end to attempts to popularize a topic that is difficult and grim, and which the most sophisticate minds of our half-century have struggled with.

The debate on nuclear weapons is in a sad state and this book can only make it worse



## Chapter 1. The Weapons

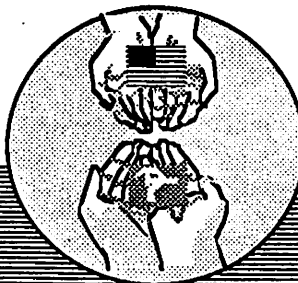
This chapter presents a survey of nuclear weapons ...



...the delivery systems...



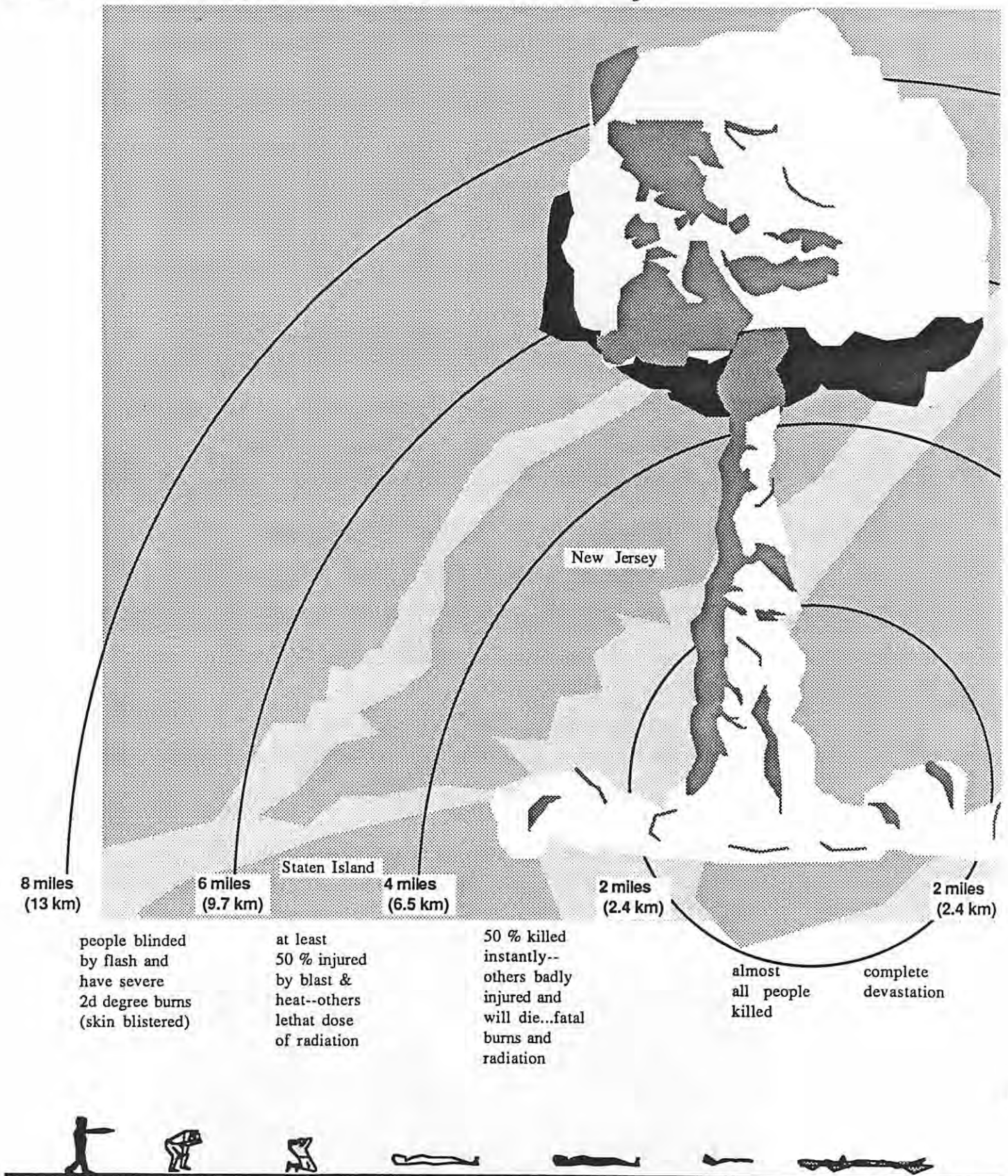
...and the basic strategic consequences...



Everybody knows that nuclear weapons are devastating in the extreme.

It is well to remind ourselves, however, once in a while about just exactly how devastating they are.

# What would be the effects of a single one megaton nuclear weapon on New York City?





In all of the wars that the U. S. has faught in over 200 years, approx. 1.2 million people have been killed.

In less than one minute, a single nuclear weapon exploded on New York City would kill many more people.

There are more than 7 million people living in the New York metropolitan area.

Manhattan

Queens

4 miles  
(6.5 km)

6 miles  
(9.7 km)

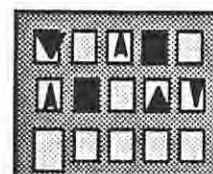
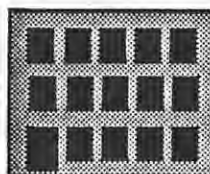
8 miles  
(13 km)

severe damage...  
most buildings  
damaged or destroyed...  
main fire area...  
everything that  
can burn, will  
burn.

extensive damage...  
considerable fire...  
all clothing, canvas,  
cloth catches  
fire...

less extensive  
damage...some  
fires, branches  
and some trees  
down

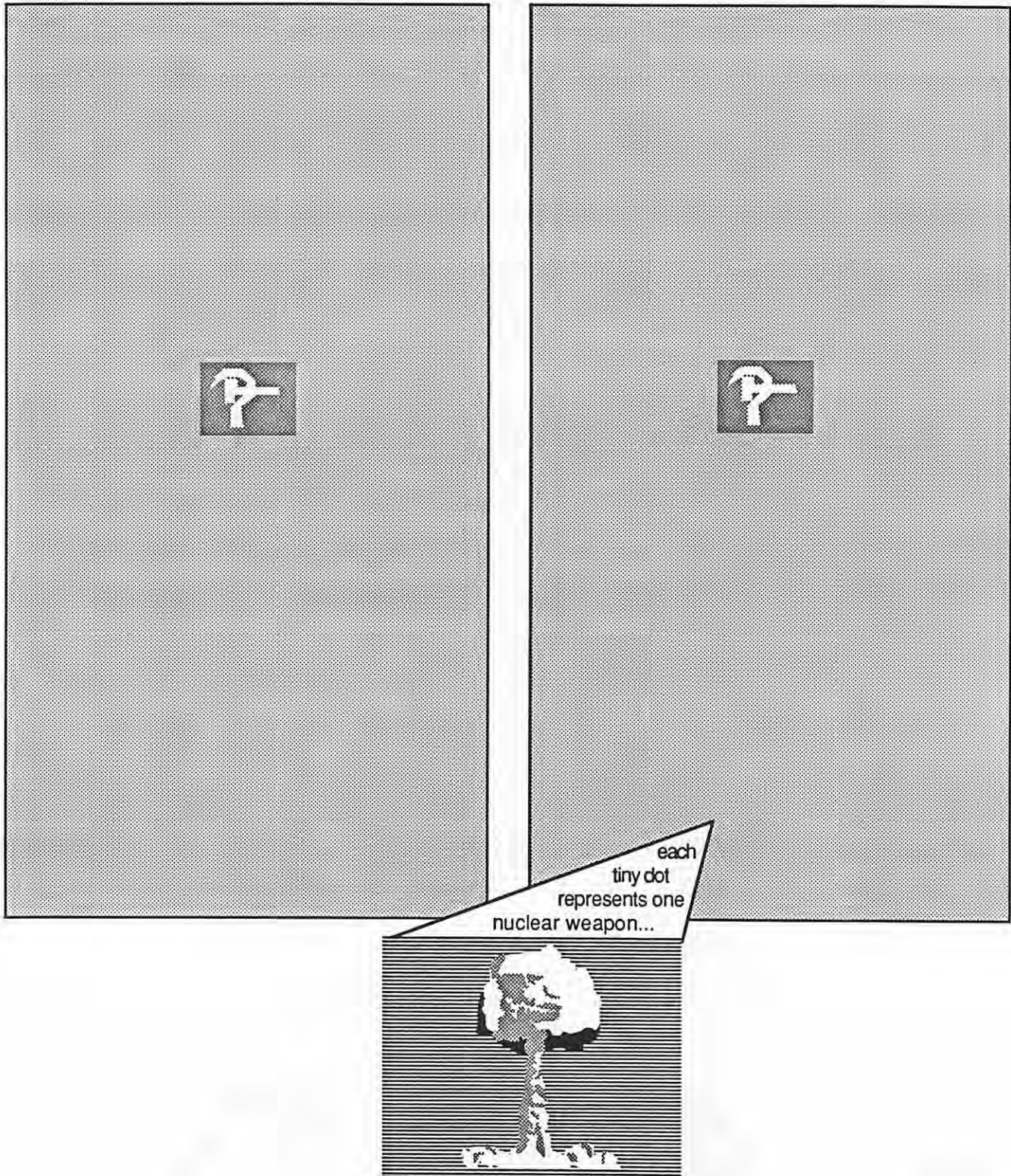
less damage...  
radioactive fallout  
makes use of  
property dangerous



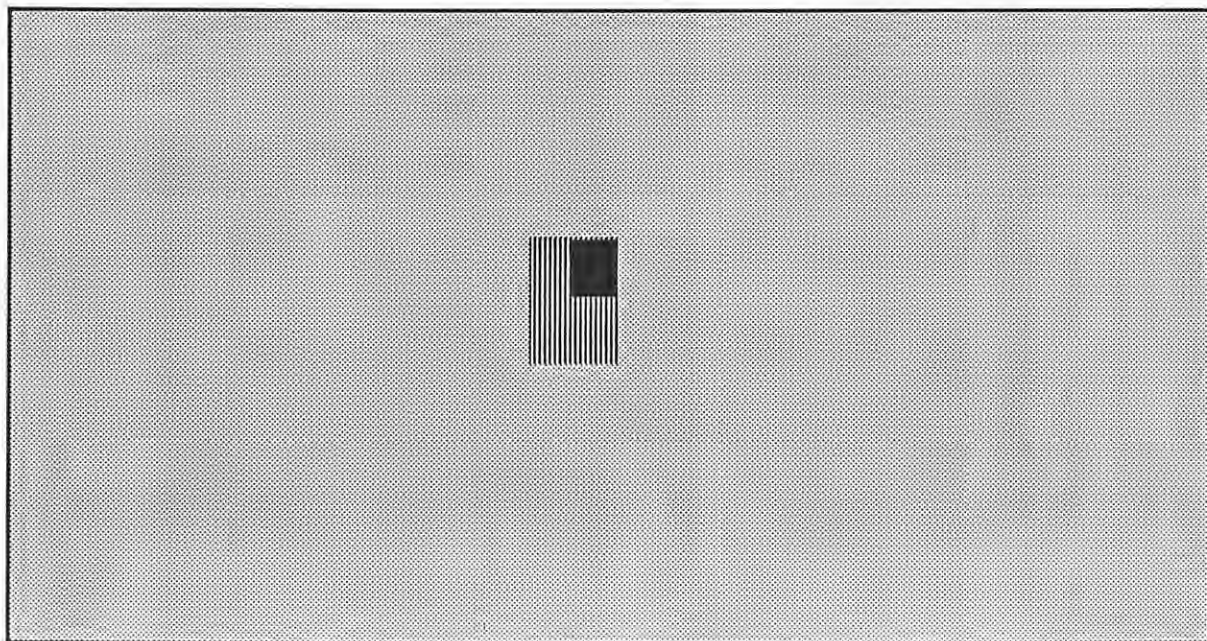
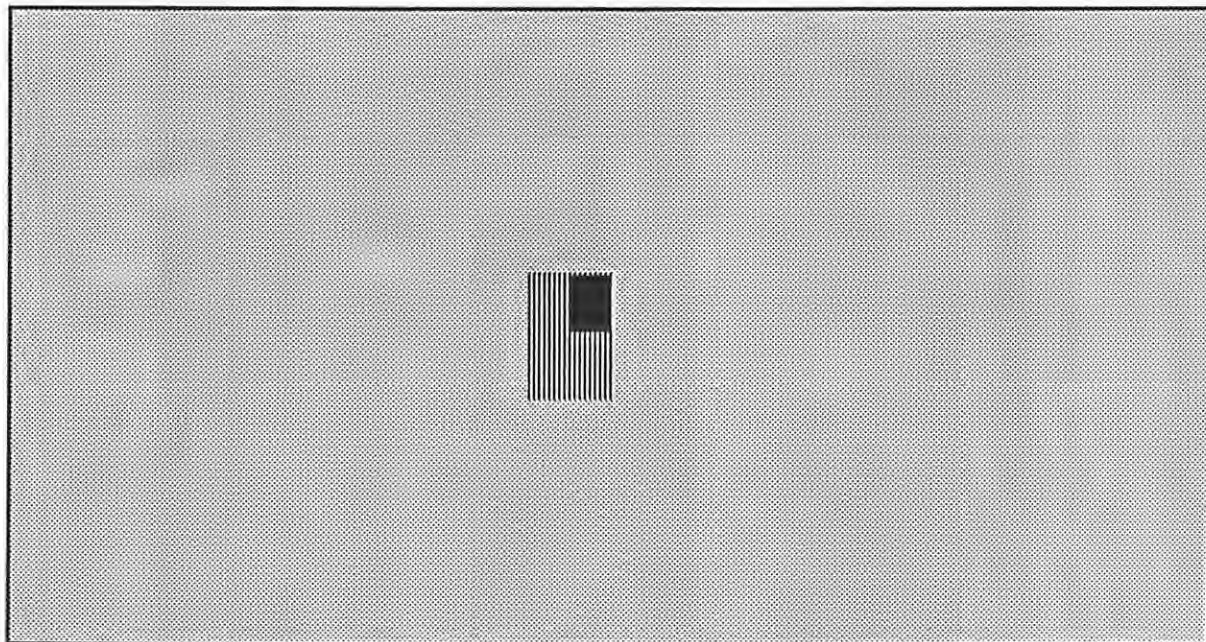
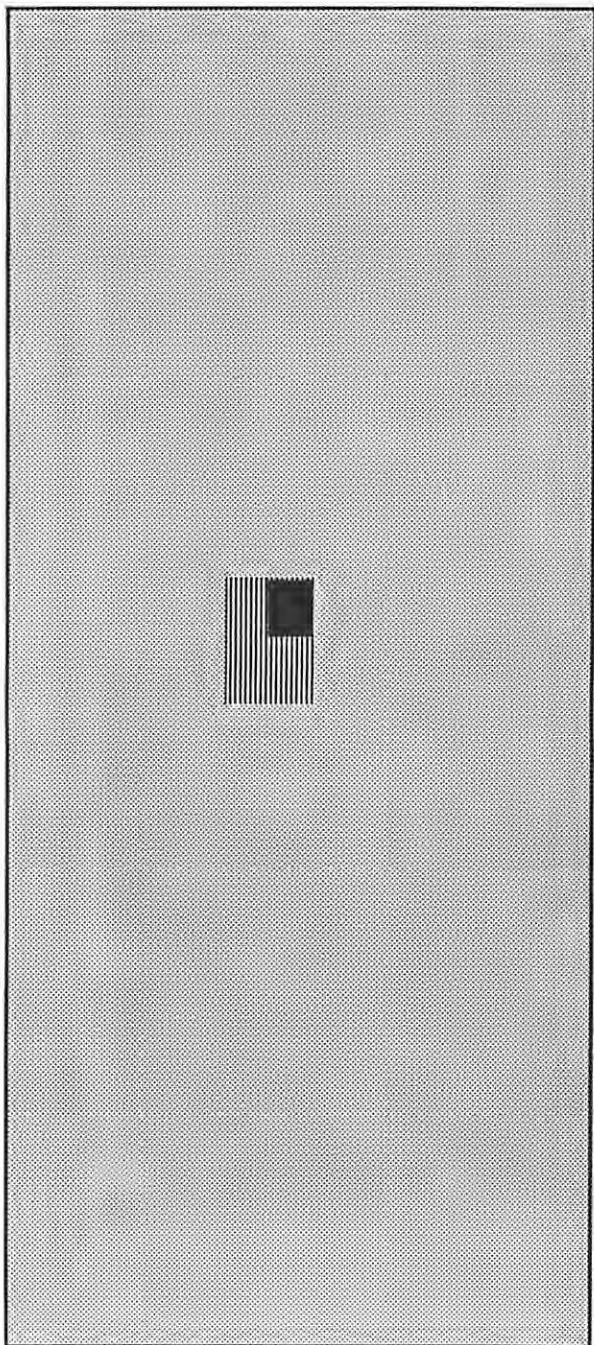
# How many nuclear weapons are there now deployed by the superpowers?

There are about 10,000 dots in each of the boxes on these two pages, one dot for each operational nuclear weapon.

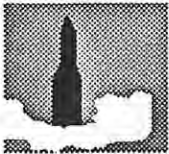
Total: 50,000 weapons for the two superpowers combined...











How nuclear weapons would travel to their targets.

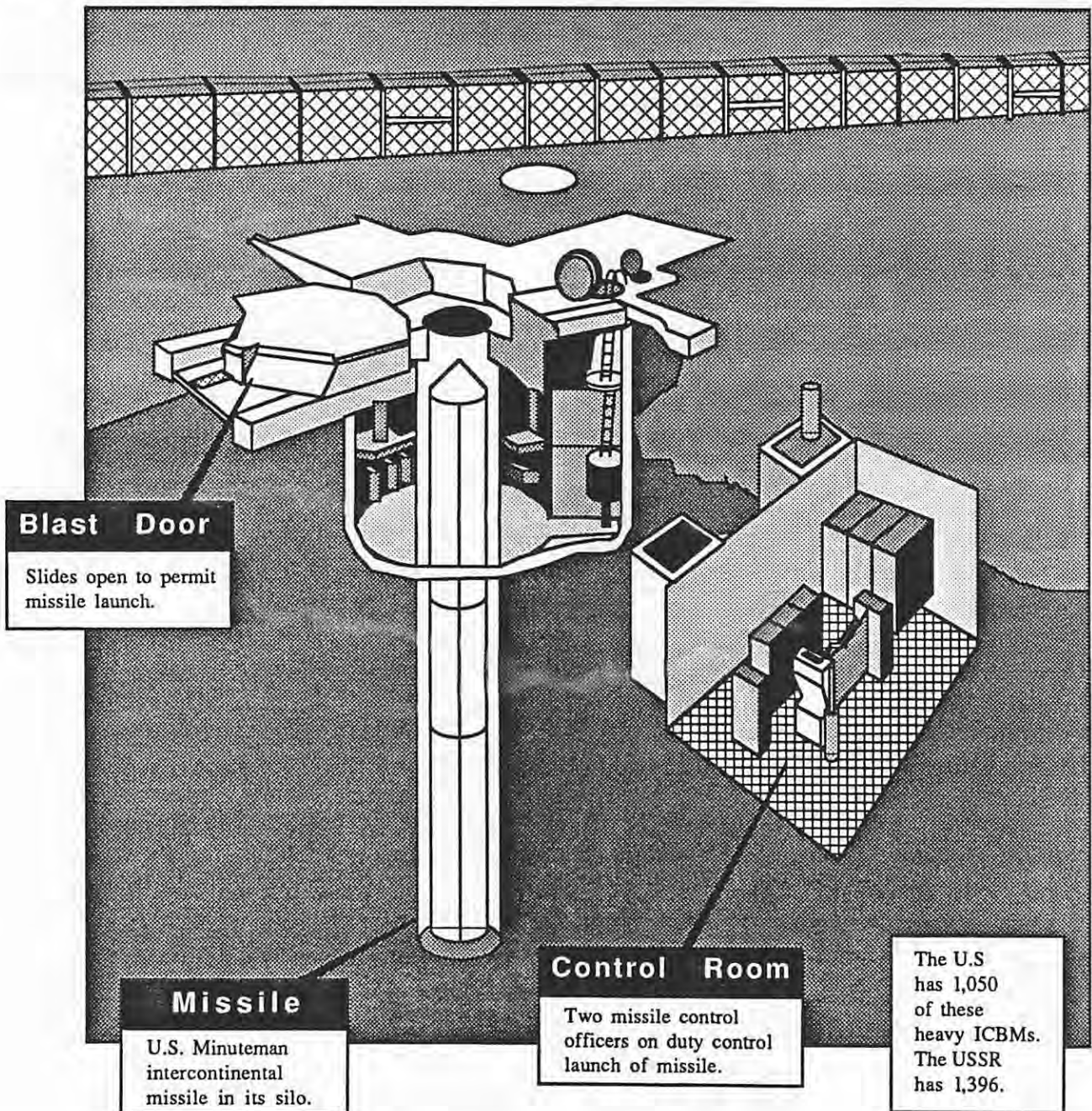
# Intercontinental Ballistic Missiles (I.C.B.M.s)

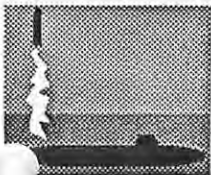
Each superpower has a force of ballistic missiles that can fly over 6,000 miles to their targets

Six thousand mile range...Time to arrive: 30 minutes or less....Accuracy: as little as 200 yards...



**Missile Silo** (Many ICBMs are protected deep in the ground in hardened "silos.")



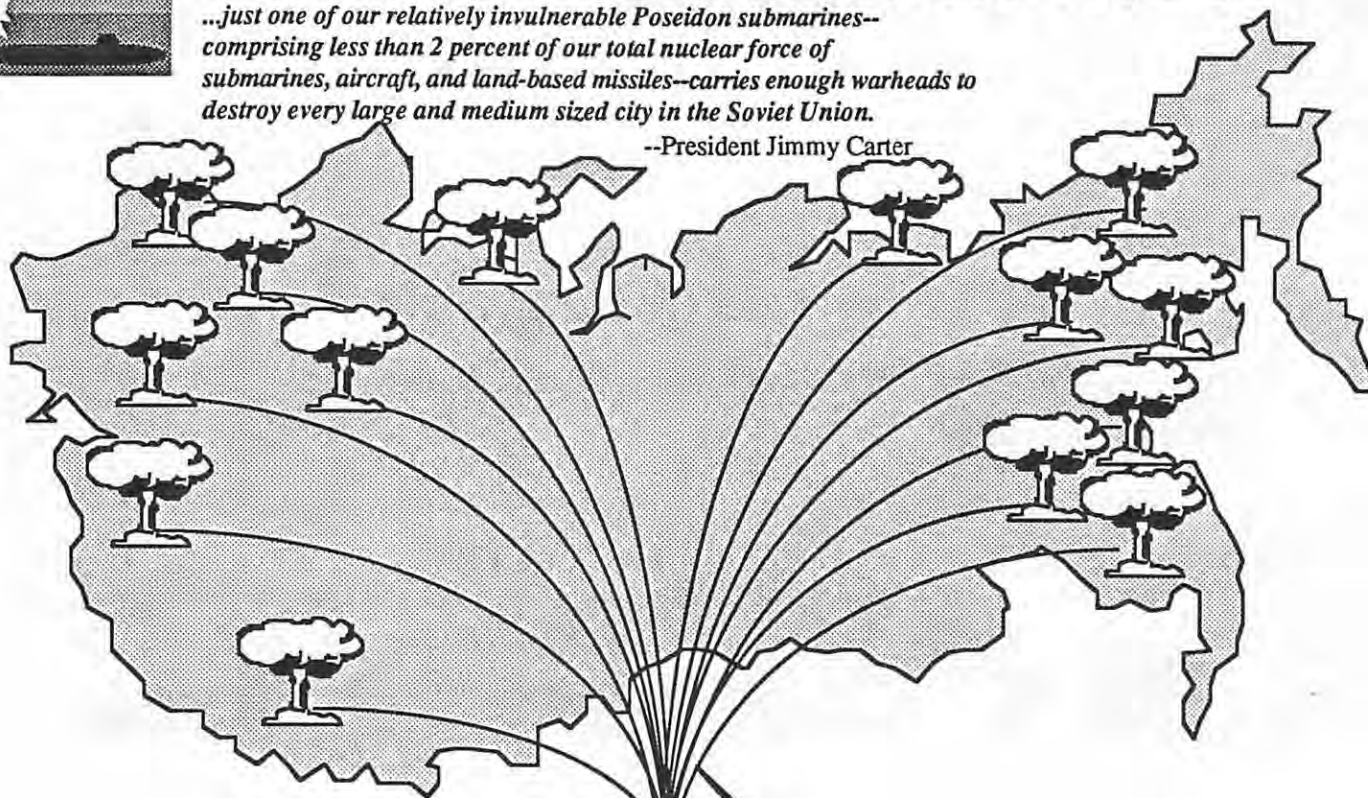


How nuclear weapons would travel to their targets

# Submarine Launched Ballistic Missiles

*...just one of our relatively invulnerable Poseidon submarines--comprising less than 2 percent of our total nuclear force of submarines, aircraft, and land-based missiles--carries enough warheads to destroy every large and medium sized city in the Soviet Union.*

--President Jimmy Carter



Each Poseidon submarine carries 16 missiles.

Each missile carries 10 to 14 independently targetable warheads.

*What do Soviet leaders think U.S. nuclear submarine crews are going to do if they learn that the United States has been destroyed? Go to Tahiti and retire?*

--Frank von Hippel  
Princeton Univ. physicist

The U.S. has 41 missile launching submarines. The U.S.S.R. has \_\_\_\_

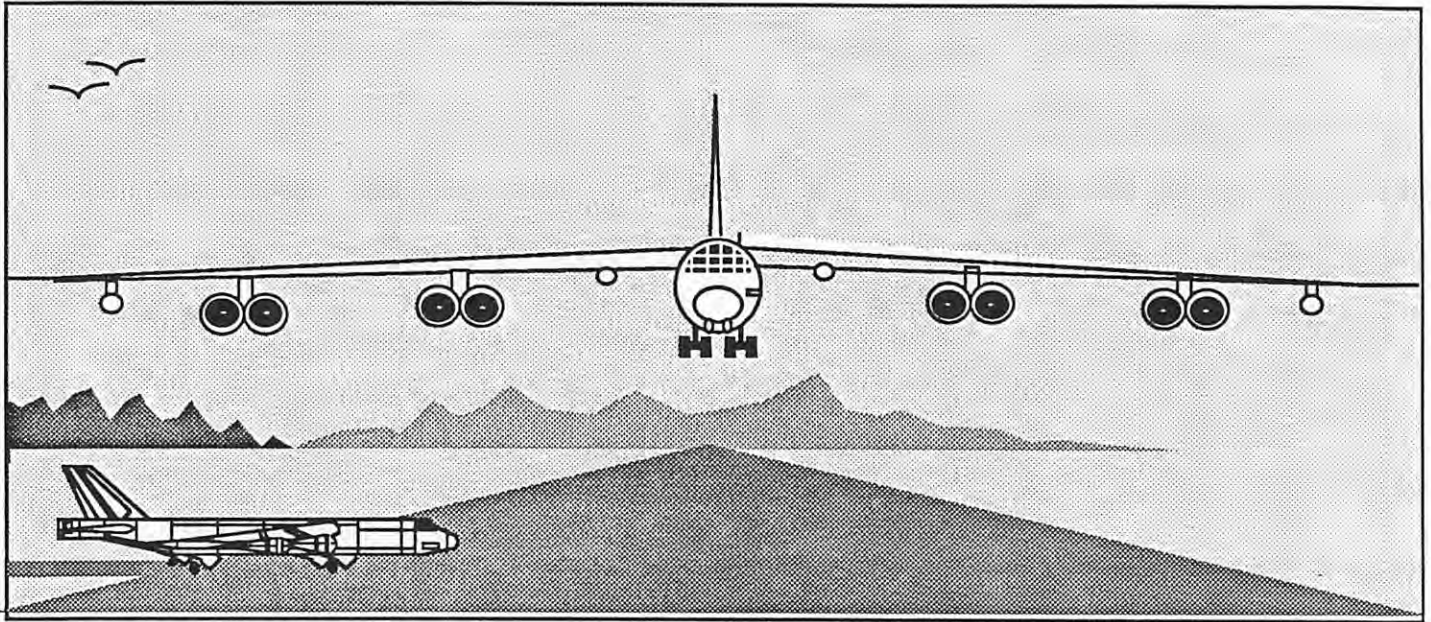




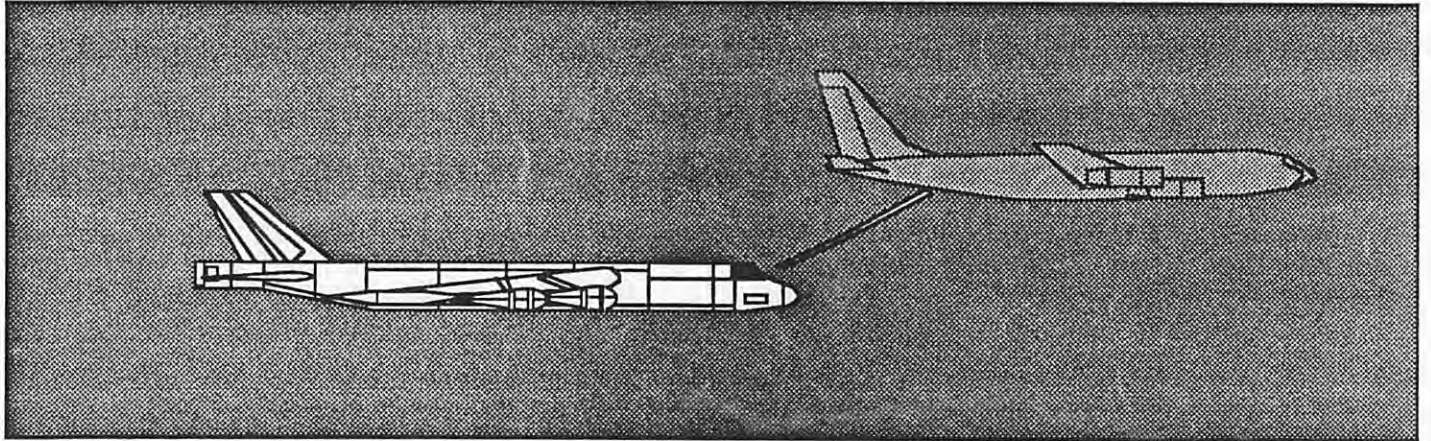
A third method of delivery of nuclear weapons is...

## Long Range Bombers

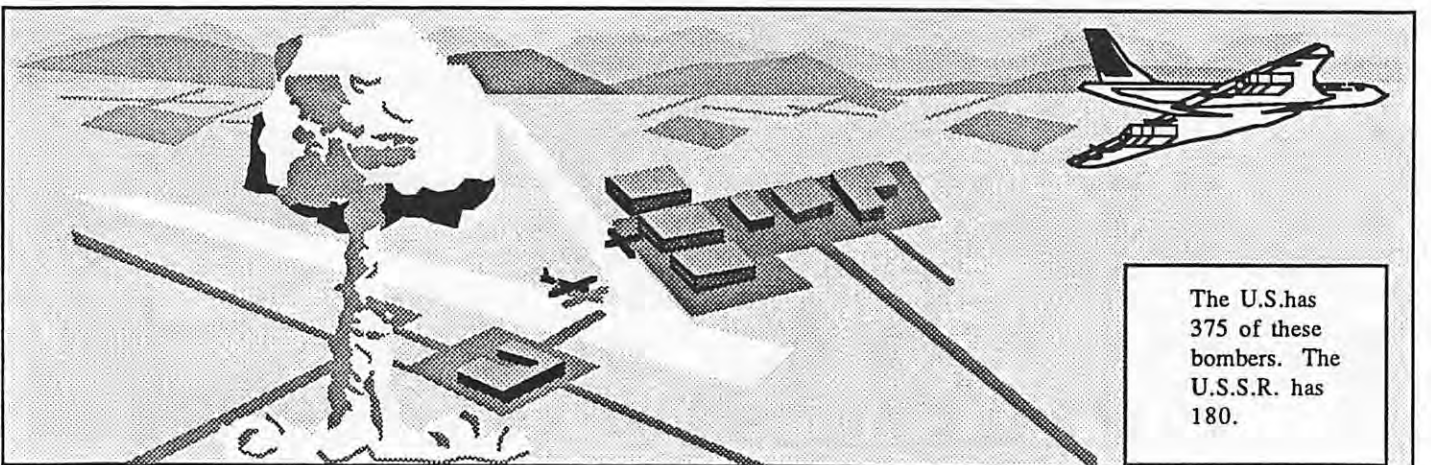
Both superpowers maintain fleets of long range bombers.



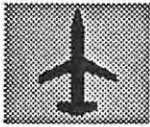
They have an intercontinental range. (with in-flight refueling)



The bombers can fly to other countries, drop their bombs or missiles, and return.



The U.S. has  
375 of these  
bombers. The  
U.S.S.R. has  
180.

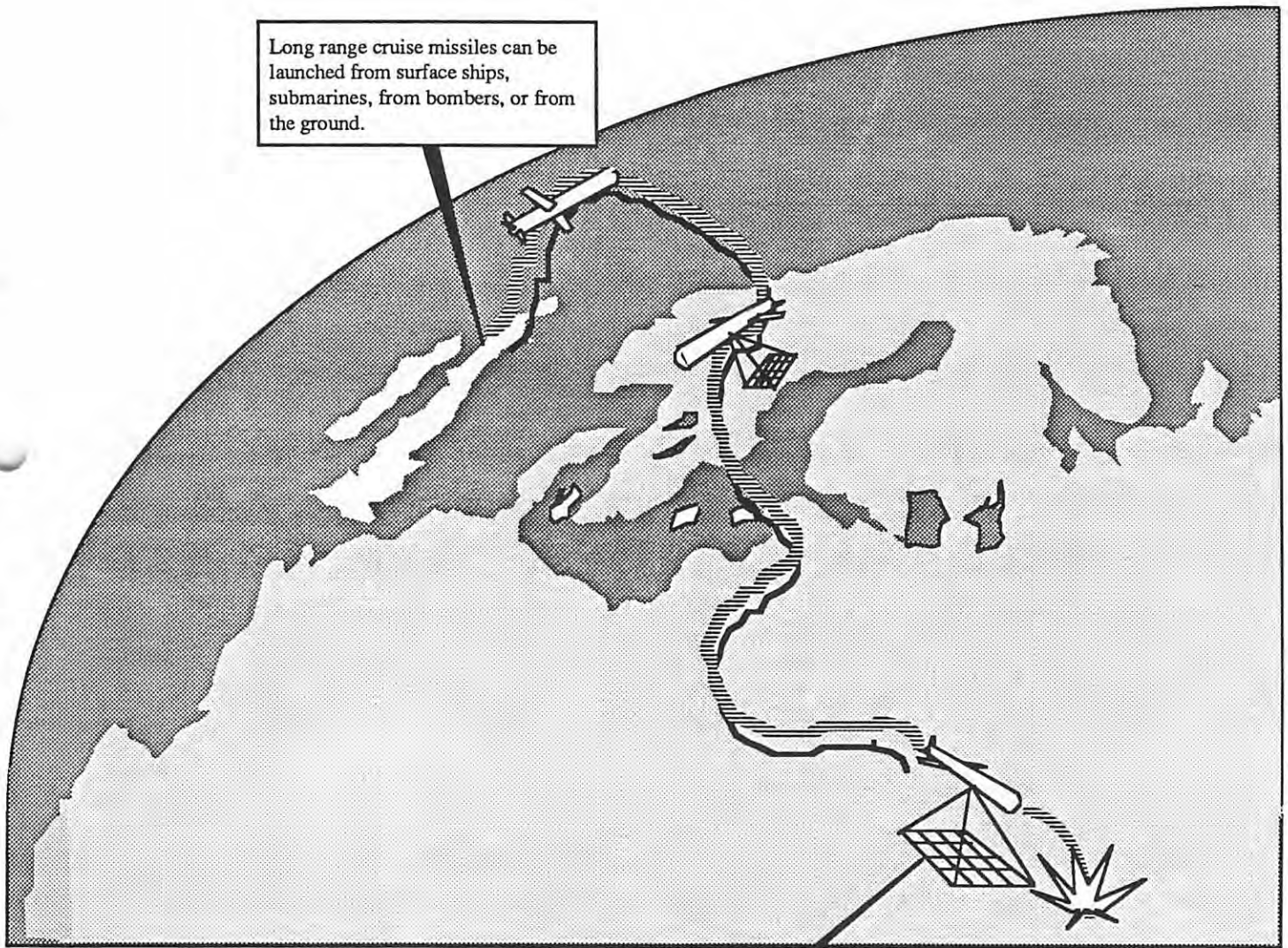


A fourth method of delivery of nuclear weapons is...

# Long Range Cruise Missiles

Both superpowers have fleets of long range cruise missiles. These are relatively slow-flying, pilotless, fixed wing aircraft.

Long range cruise missiles can be launched from surface ships, submarines, from bombers, or from the ground.



They are guided by very sophisticated computers that have sensors that look at the ground and match what they see with a map stored in the missile's computer. The computer keeps looking and comparing and correcting the course of the missile until it reaches its target.

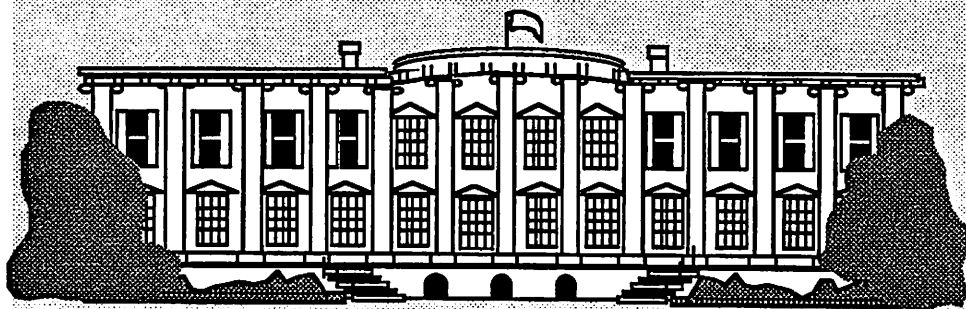
The U.S. has approx. \_\_\_\_ of these cruise missiles  
The U.S.S.R. has approx. \_\_\_\_.



*Before nuclear weapons, nations could make decisions that would affect their own security. They could make policies that would help them defend themselves. But what is new about a superpower's security today is that...*

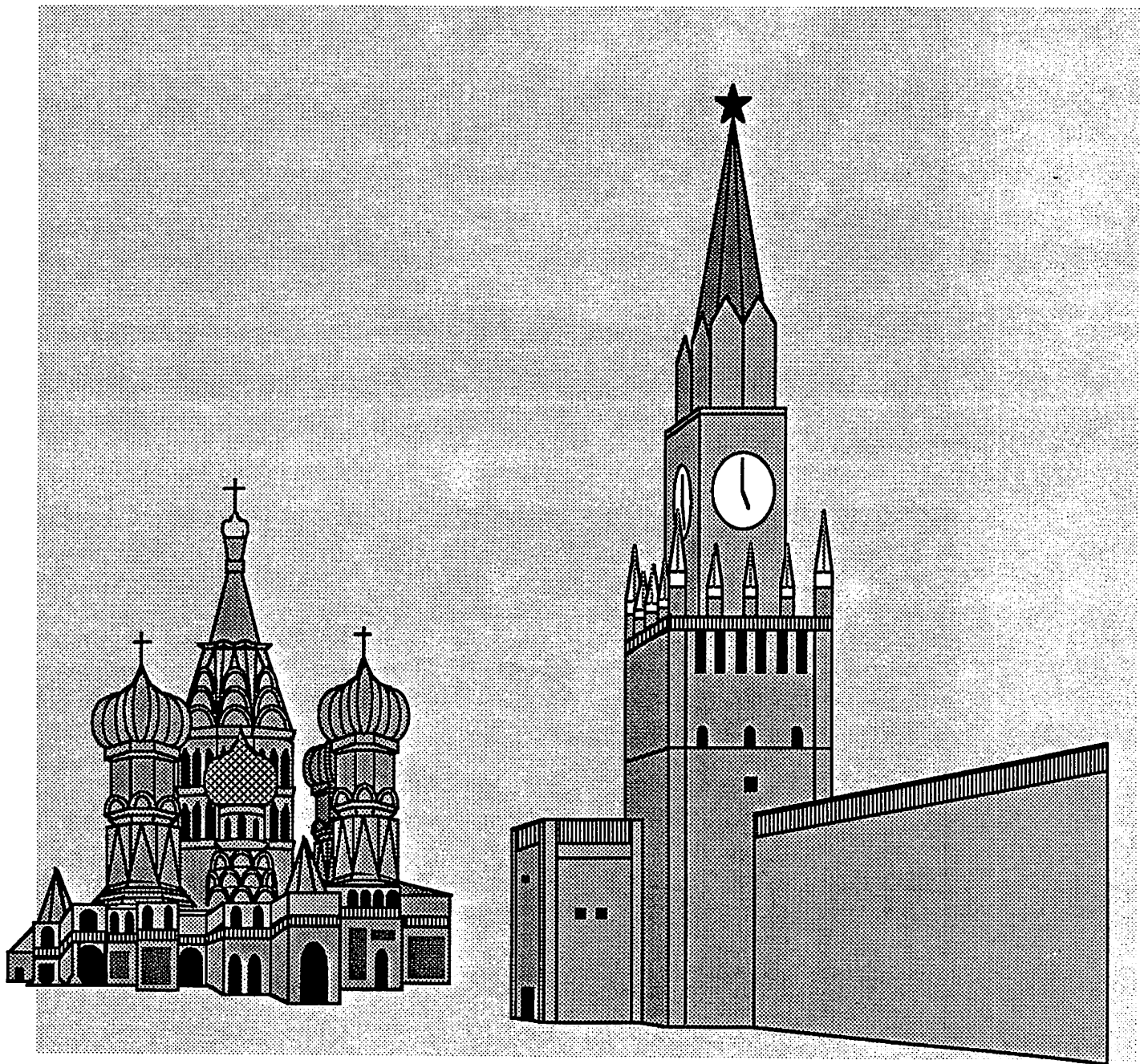
**Our national security is decided in the Kremlin...  
their security is decided in Washington..**

...this is the first paradox of the nuclear age...  
we can not defend ourselves...they cannot  
defend themselves...we both depend--equally--  
on the stalemate of mutual nuclear deterrence...



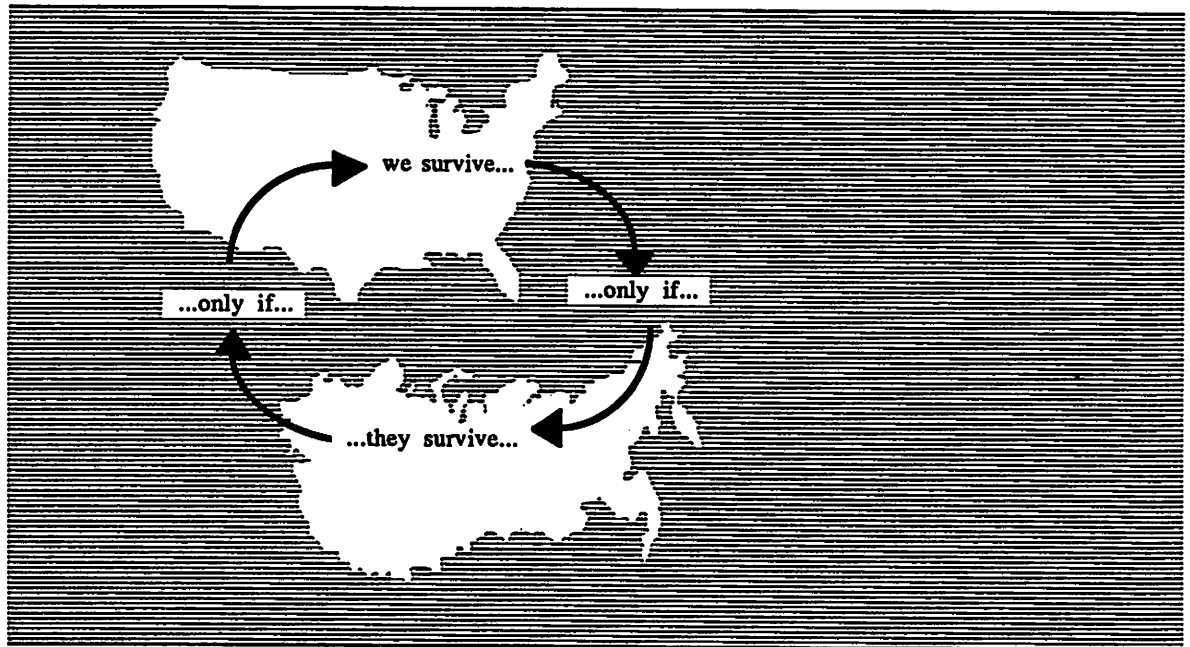
***"...in our lifetime and that of our children, cities will be protected by the forbearance of those on the other side, or through effective deterrence."***

James Schlesinger  
former U.S. Secretary of Defense

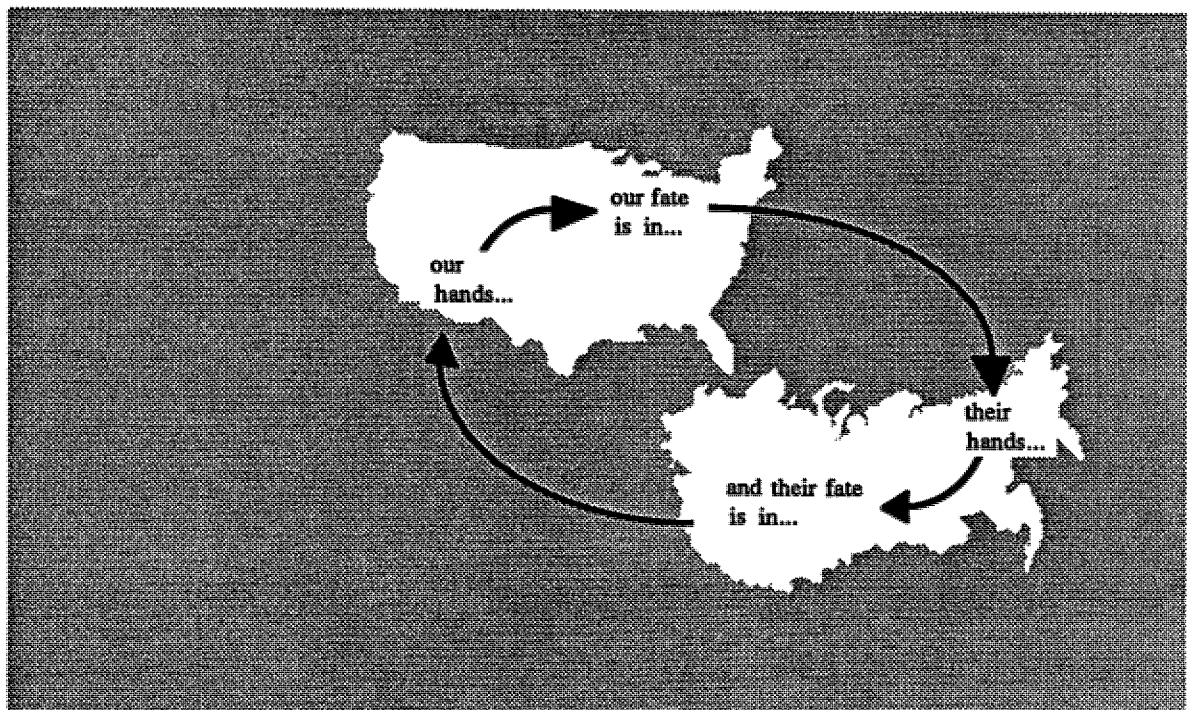


# The security relationship between the superpowers is dramatically different from any past relationship between any two nations...

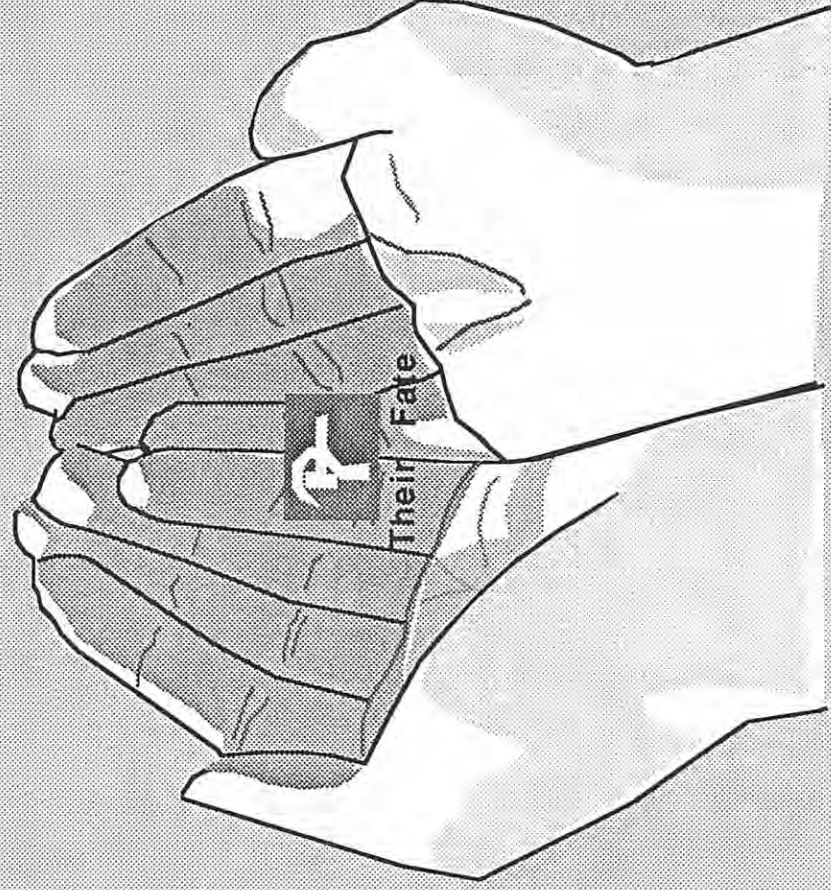
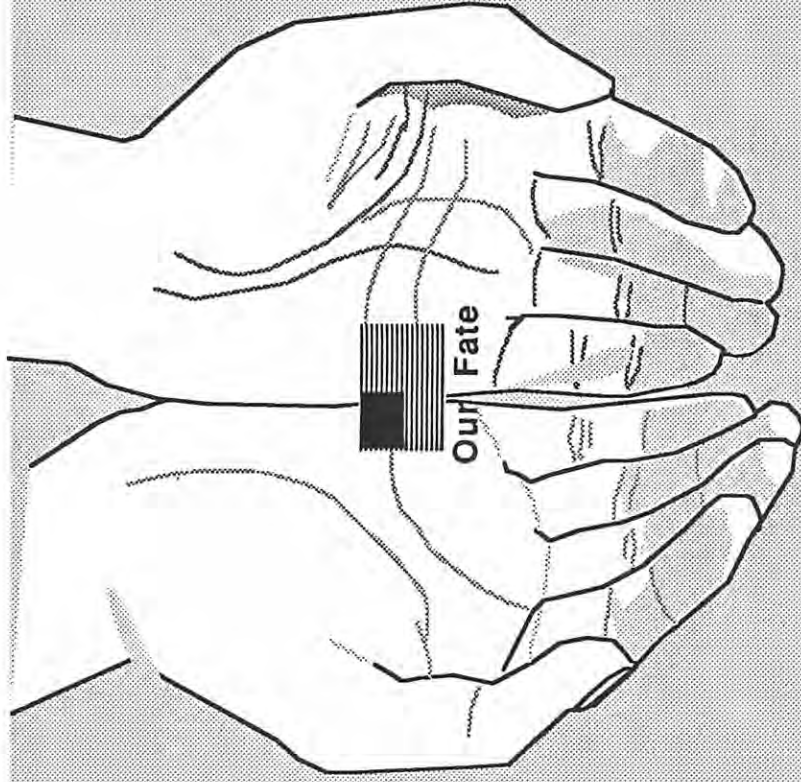
In the past, when a nation won a war, its society survived.  
Now, there is certain destruction for both societies. There are no winners.  
For the superpowers this produces an unprecedented common self interest.....

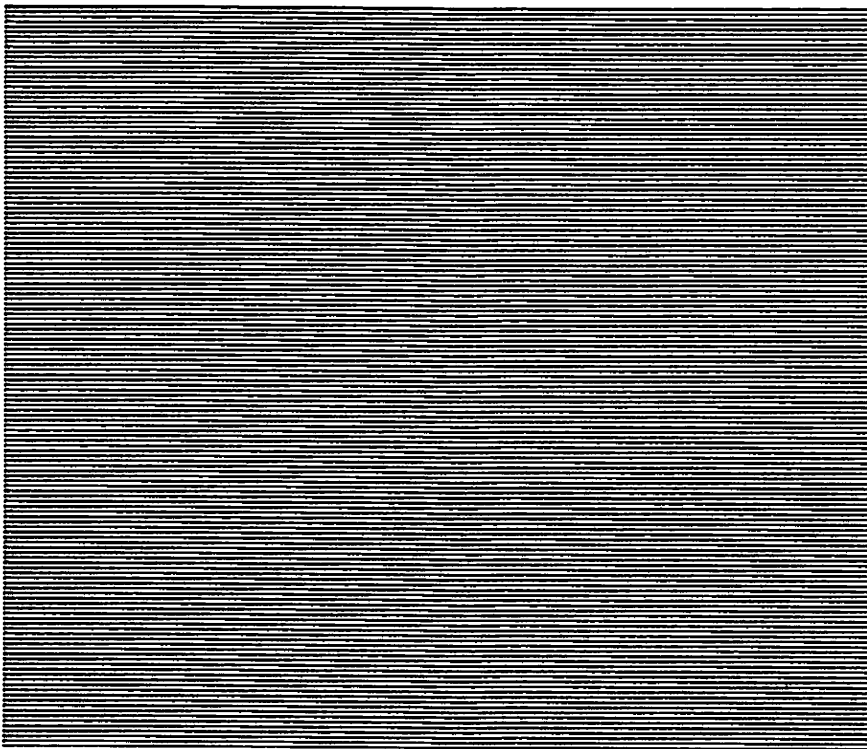


In a way that has never been true before in history...









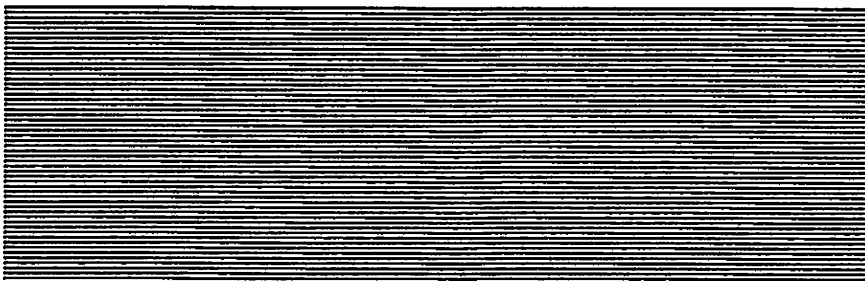
## **Chapter 2.**

# **Deterrence--The Concept**

**This chapter presents a look at the various meanings of the concept of deterrence...**

**...how it has changed over time...**

**...and what are some of its implications**



# Changes in the Concept of Deterrence

## U.S. Monopoly

From 1945 until the early 1950's the United States had a few nuclear weapons. No other country had any. The U.S.S.R. tested its first bomb in 1949. During this period no specific strategy of nuclear weapons use prevailed, although various strategists were examining the implications of the weapons on the nature of war.

## Massive Retaliation

Announced in 1954, the U.S. policy of massive retaliation was thought to deter what was then perceived as an overwhelming Soviet threat in Europe and Asia.

### Definition.

Massive retaliation is the use of an overwhelming nuclear attack to respond to aggression, even conventional aggression, anywhere in the world. It was primarily a policy that was used when the Soviet Union had only a few nuclear weapons. It was thought by some to deter the U.S.S.R. from using its much larger conventional forces from over-running Europe. The policy became less credible as the Soviet Union began to deploy sizeable nuclear weapons.

## **Assured Destruction**

By the 1960's, both superpowers had the ability to devastate the other side with second strike nuclear weapons. This led to the development of the "assured destruction" concept in strategic thought first used by U.S. Secretary of Defense Robert McNamara in 1964.

### **Definition.**

Assured destruction refers as much to the situation in which the two superpowers found themselves, deterred from starting a nuclear war because to start one would also assure the initiating country's national destruction. Deterrence is thus thought about as an existential condition arising out of the fact that both countries have the capability to destroy the other. The conclusion drawn is that it would be suicidal and hence irrational to initiate an attack. For this reason it was called "mutual assured destruction" and the acronym MAD was used by critics.

## **Flexible Response**

In the early 1960's, the U.S. changed its official deterrent concept, especially for responding to the Soviet threat in Europe.

### **Definition.**

Flexible response policy stated that the U.S. would respond initially with conventional defense to conventional attack, but might initiate the use of nuclear weapons depending on the seriousness of the Soviet aggression. This policy was adopted as the official NATO strategy in 1967.

## **Counterforce**

Early massive retaliation deterrence depended upon targeting enemy cities and populations. It came under debate as not a credible deterrent and counterforce doctrines were developed.

### **Definition.**

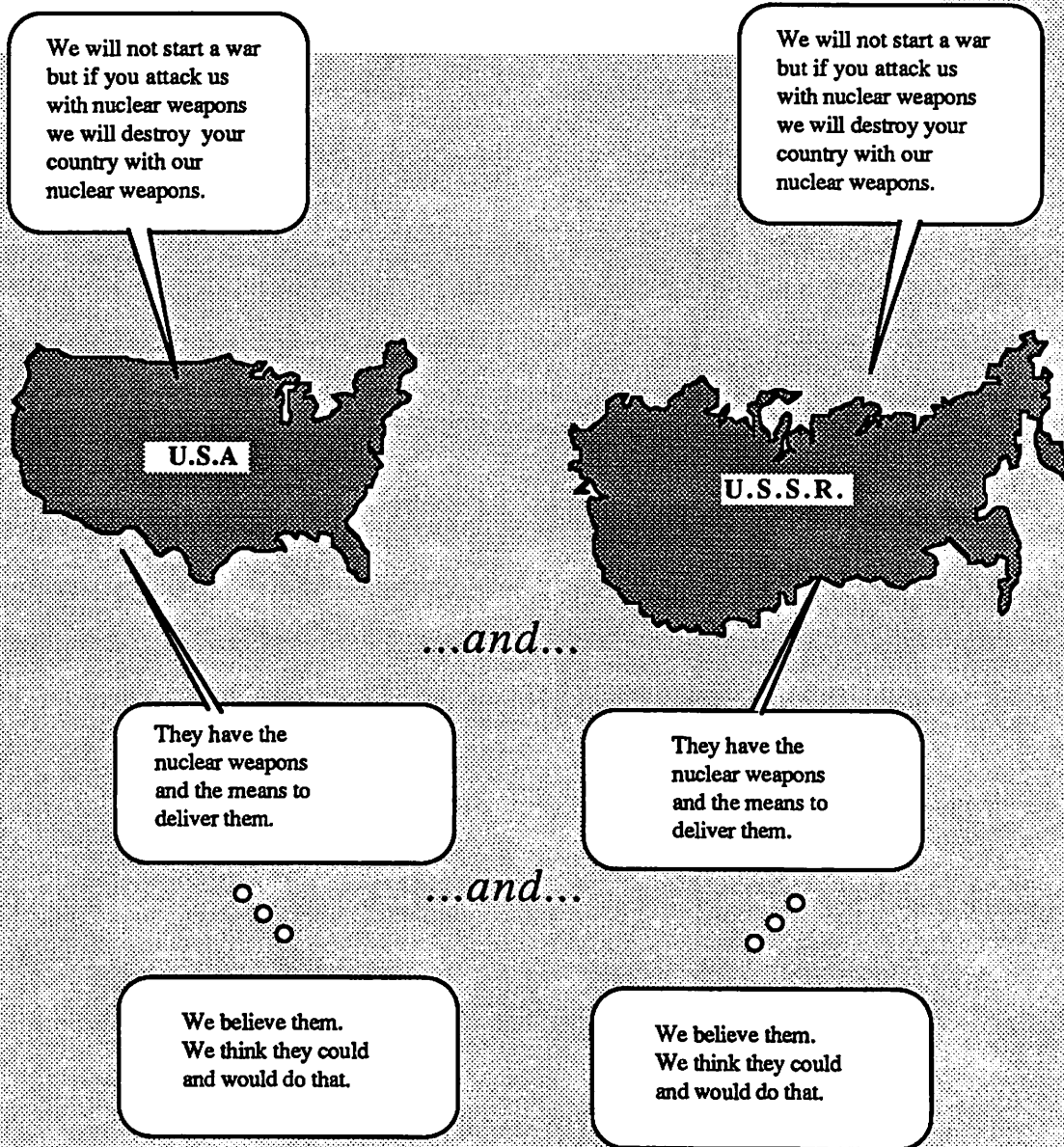
Counterforce refers to nuclear attacks on enemy military targets, and attempts to avoid cities and populations (so-called countervalue targets). Called the "no-cities" strategy, it became the announced U.S. policy in 1962.

We find ourselves in the condition of nuclear deterrence.

# What is nuclear deterrence?

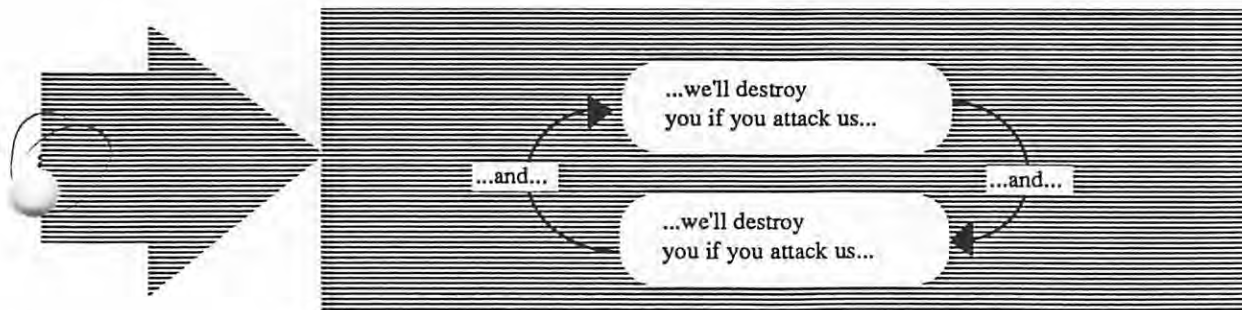
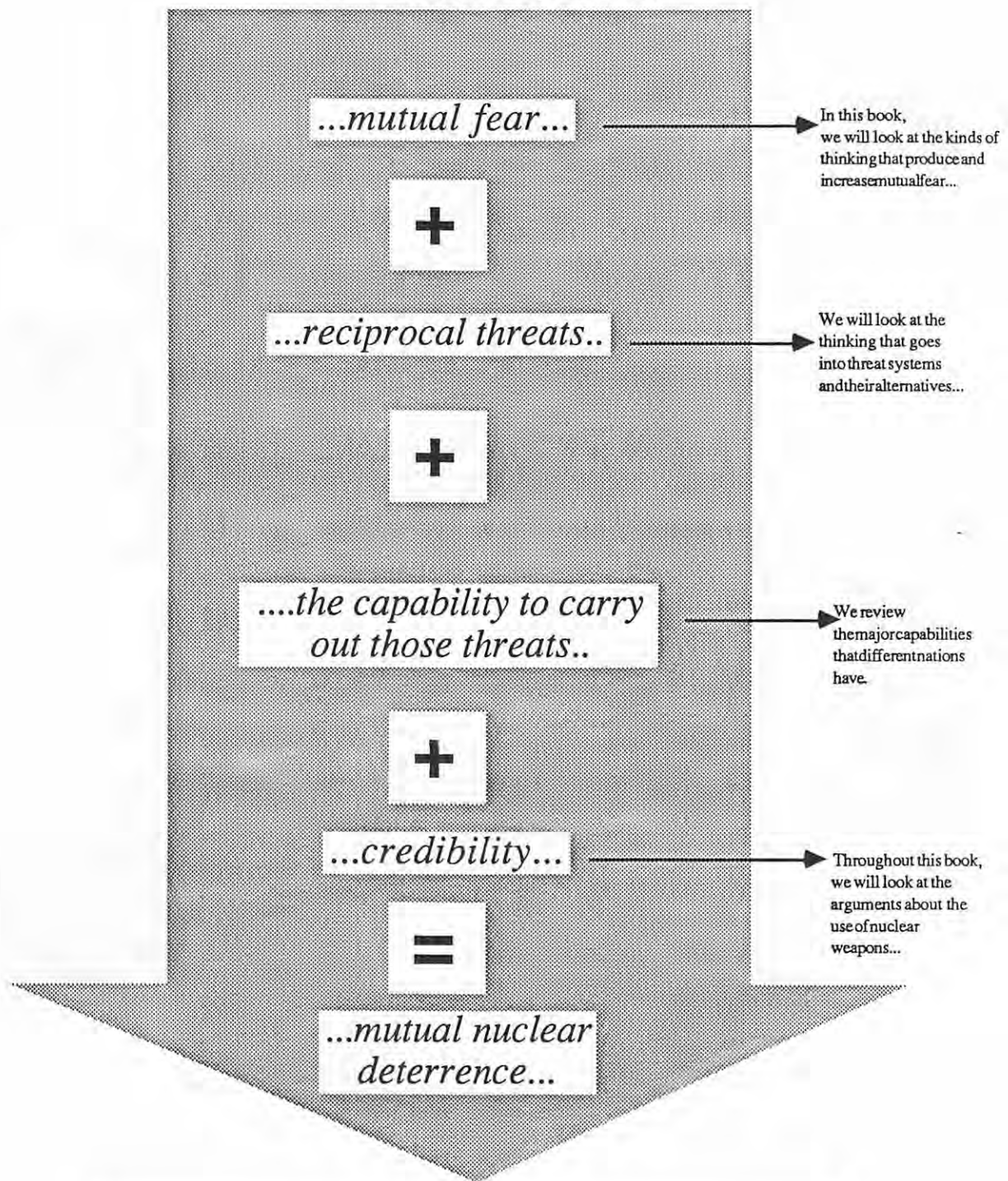
## Definition

The condition of deterrence can be defined as both superpowers maintaining sufficient nuclear weapons readiness such that the other side will think...





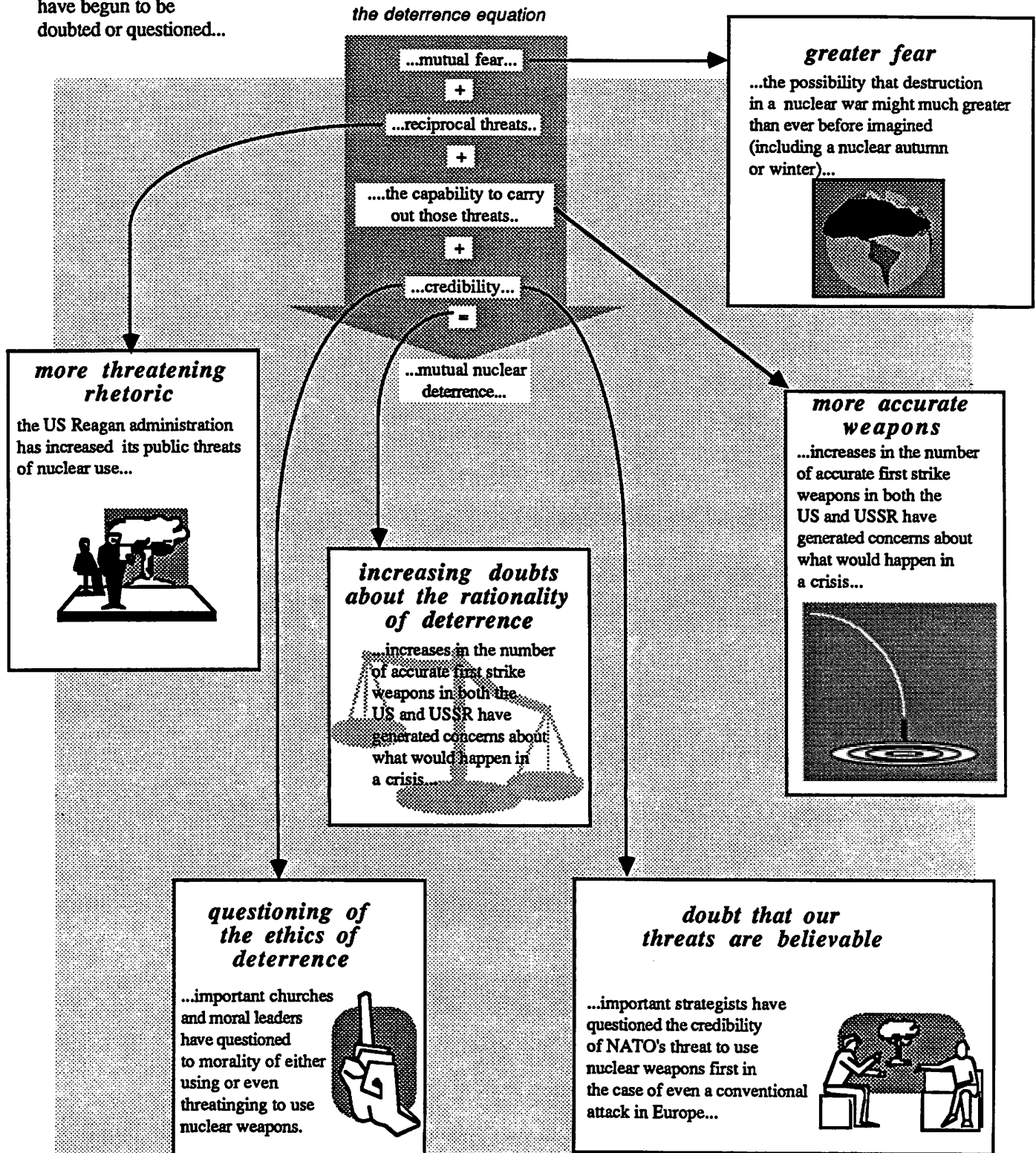
## The deterrence equation...



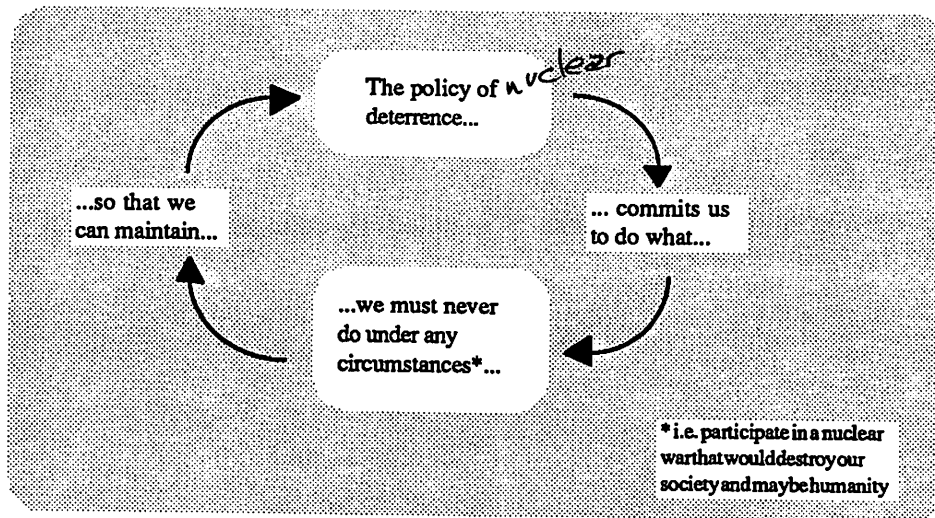


# Why has belief in deterrence begun to be questioned in this decade?

Different parts of the deterrence equation have begun to be doubted or questioned...



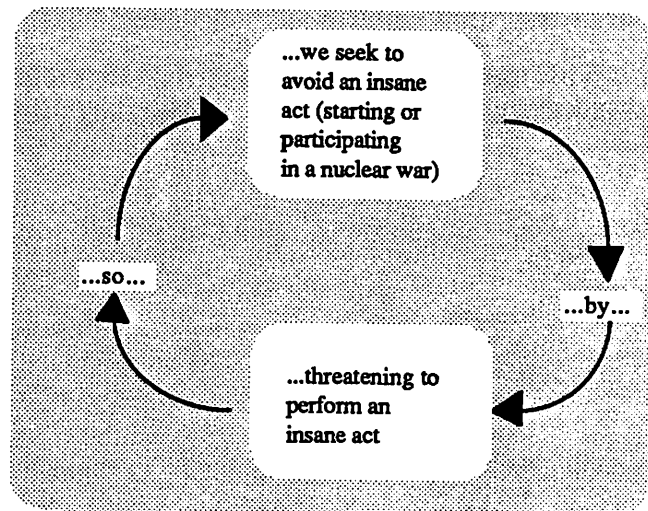
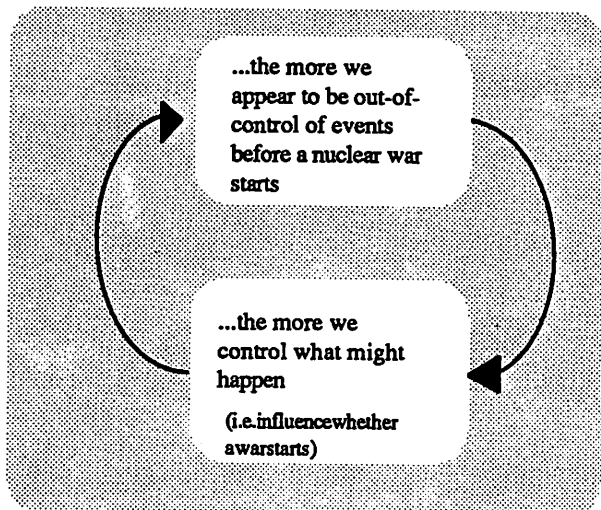
# One of the reasons for questioning deterrence are the paradoxes...



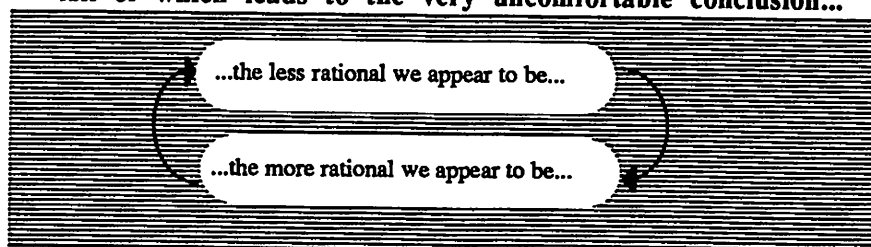
...and...

...the policy of deterrence also commits us to behave as if we can not control events once nuclear escalation gets out of hand, which means...

...the policy of deterrence also results in another dilemma that can be characterized as follows...



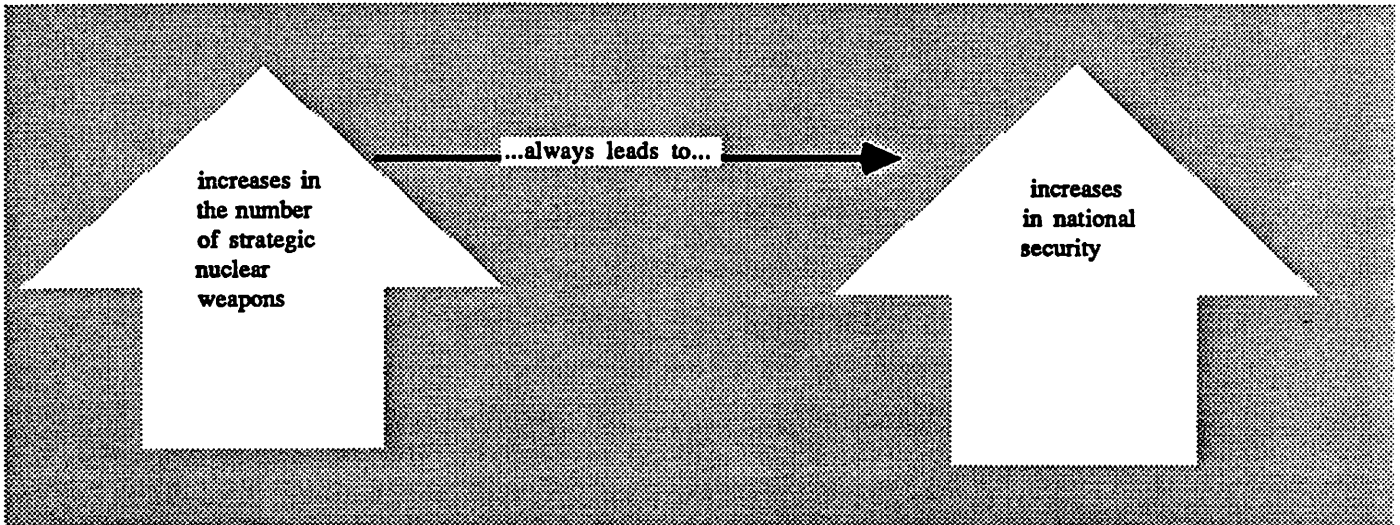
All of which leads to the very uncomfortable conclusion...



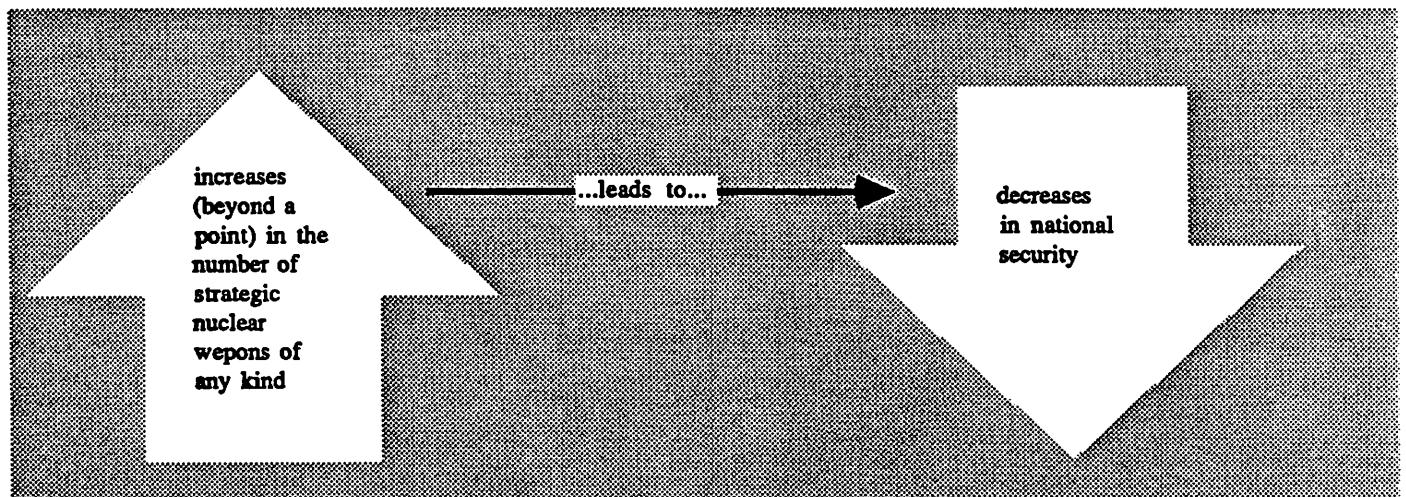
# Has national security increased with the acquisition of large numbers of nuclear weapons?

Definition: National security can be defined as the chances of survivability of a national population.

**Before the acquisition of large numbers of nuclear weapons, it was plausible to believe that...**



**...but with certain destruction ( not to mention the possibility of self-destruction asserted by the the nuclear winter hypothesis) ...**



**...this is sometimes called the...**

... the more  
you get...

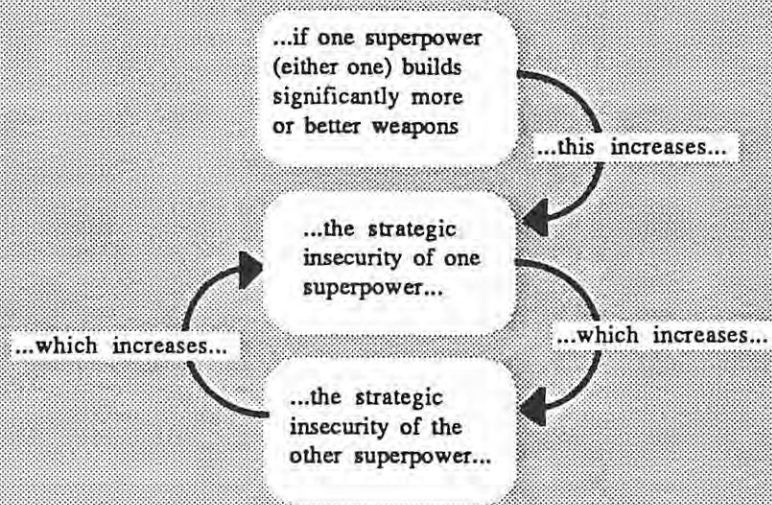
...the less  
you get...

**Dilemma**

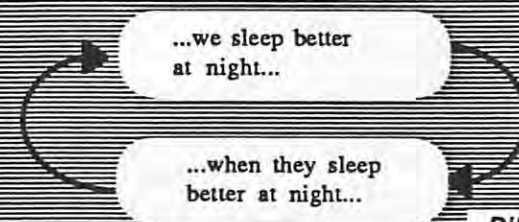


# But doesn't the increase in weapons produce more security for both superpowers?

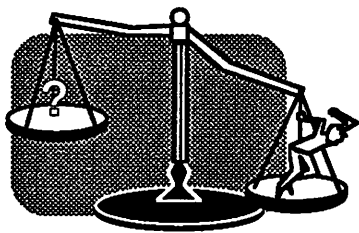
In an interactive system, it is a trap of logic to think that an action, like trying to increase your security by increasing the number or quality of your weapons, will necessarily have the effect of increasing your security. In a world where our fate is in their hands, we want them to feel secure.



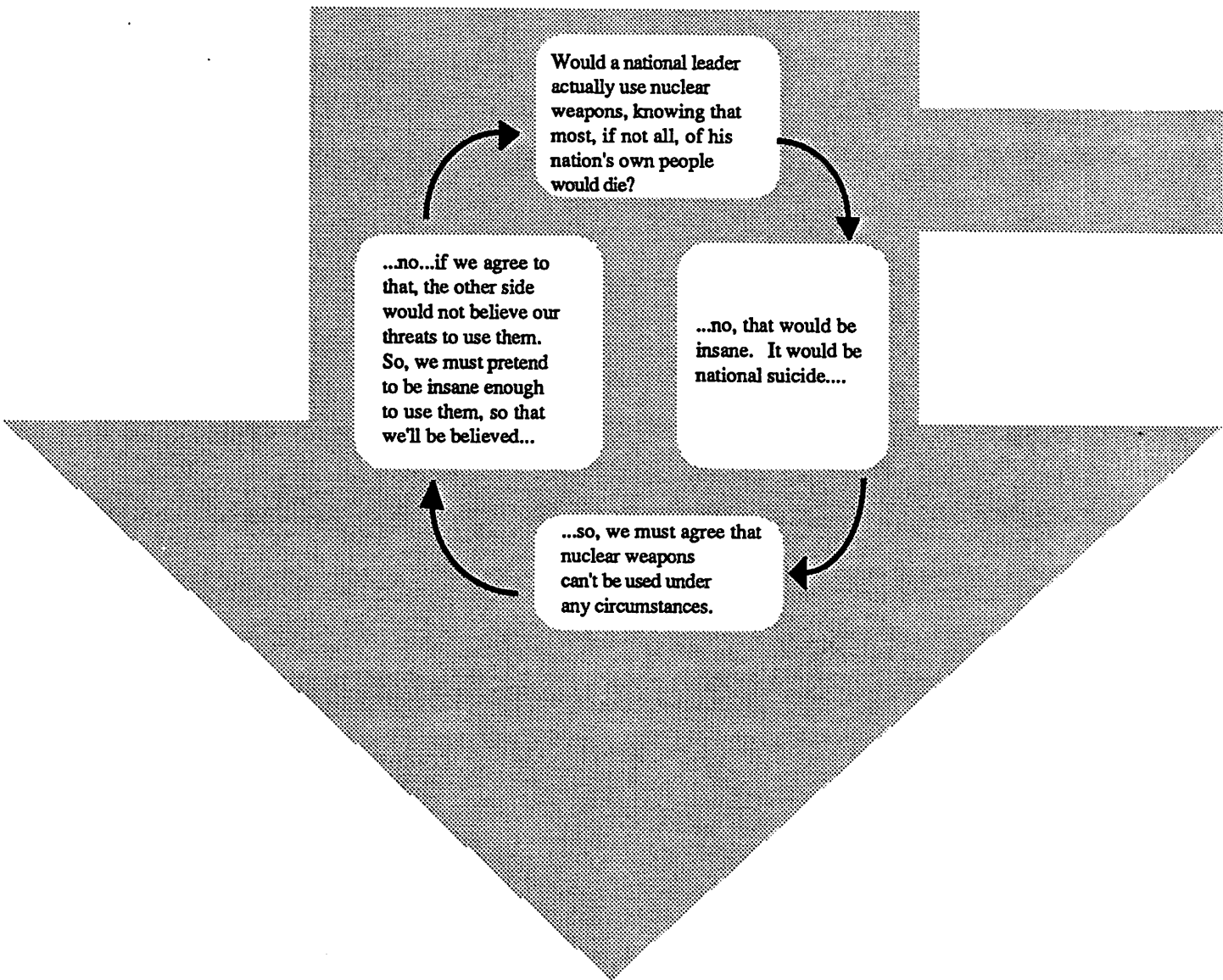
...this is sometimes called the...



**Dilemma**



# Would a superpower actually use nuclear weapons? Wouldn't that be national suicide?



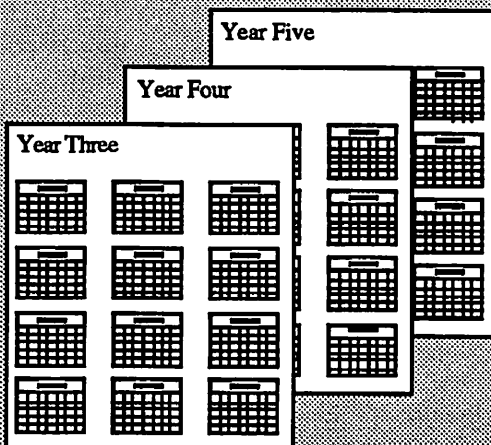
This is sometimes known as the...

...we must appear to be insane...

...in order to appear to be sane...

**Paradox**

**BUT**



...as time goes on, and we don't use them, the other side may come to believe that we are not insane and that we will not use them. So our threat becomes more unbelievable the more time goes by...

**...SO...**

We have to increase our forces, state of readiness and the accuracy of our weapons, and build more civil defense in order to make our threats believable...

But not too much or we might provoke the other side into attacking first...

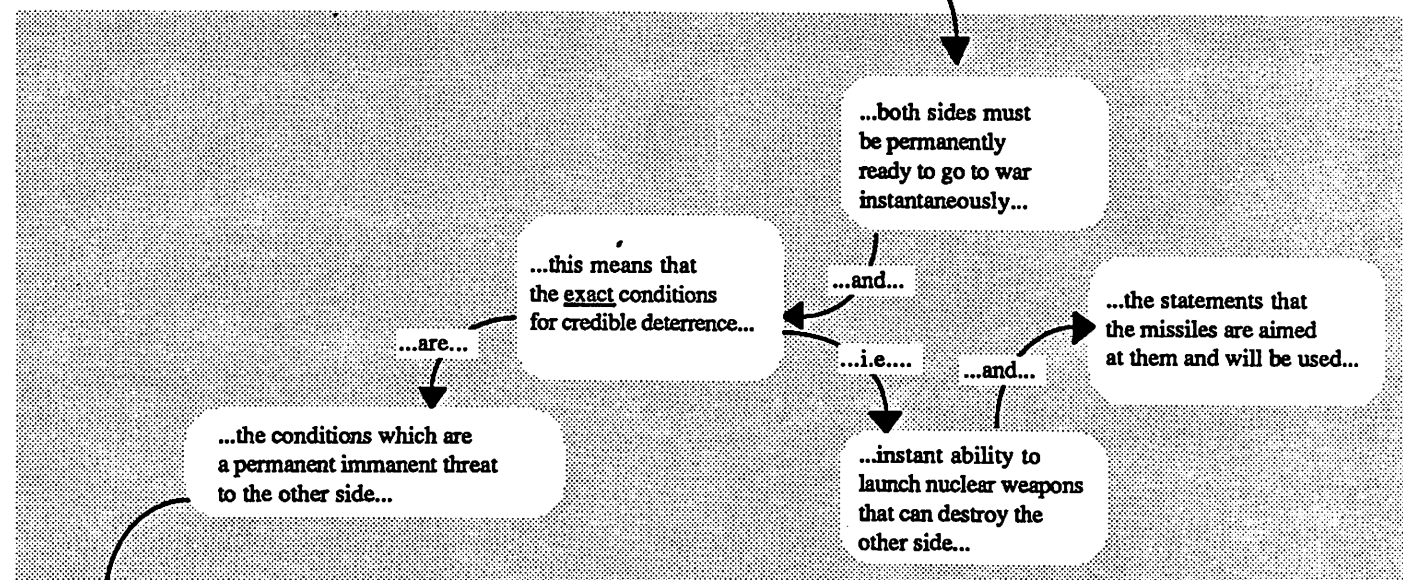
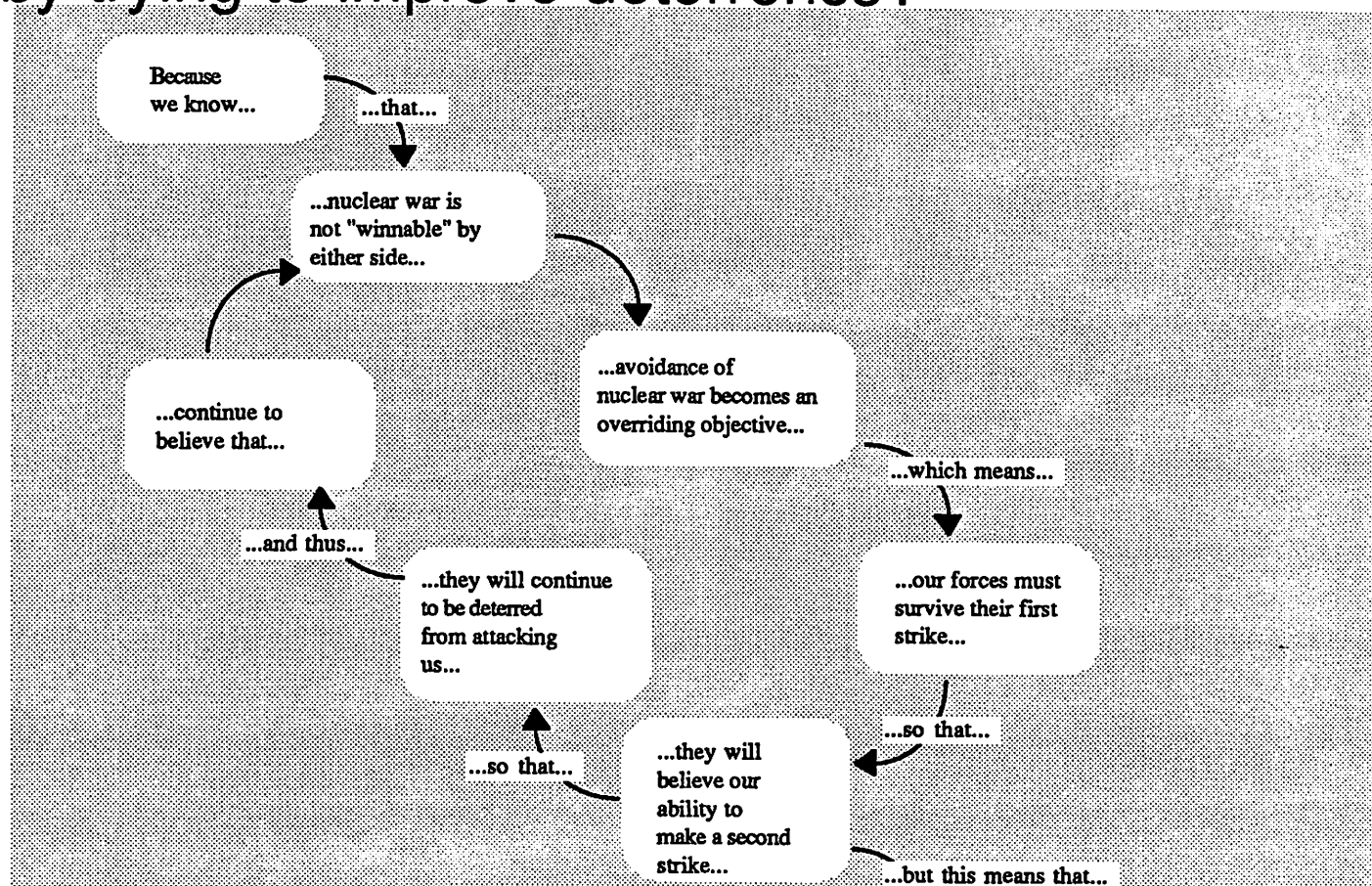
...Which of course leads the other side to build bigger, more accurate weapons, and more civil defense...

We have to create new ways to make our threat believable, perhaps by appearing slightly reckless or crazy, but not too reckless...

Which leads our opponents to behave correspondingly slightly insane or reckless...



# How have we made the world more dangerous by trying to improve deterrence?



This is sometimes known as the...

...are exactly...

...the permanent requirements that prevent a nuclear war from starting...

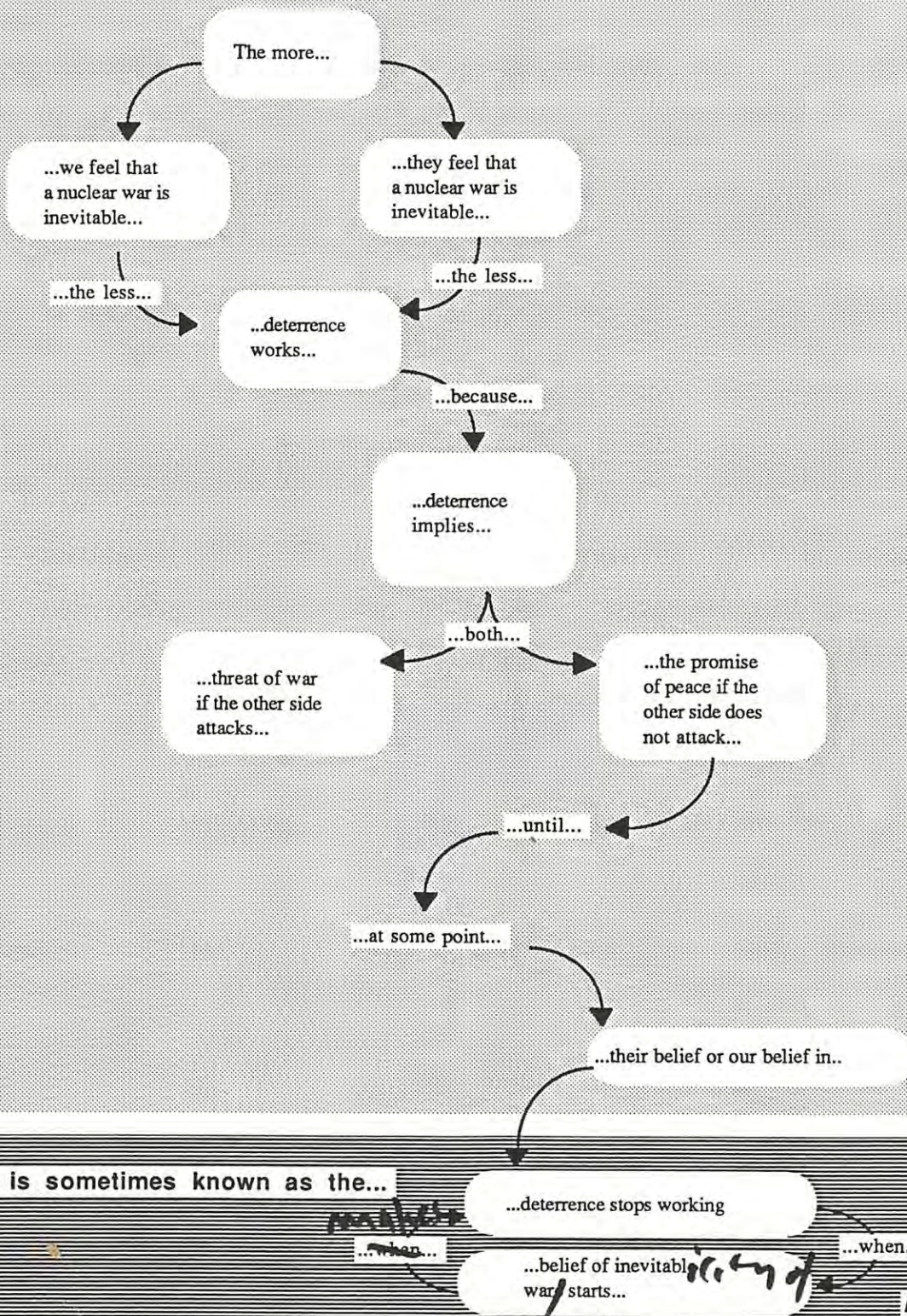
...the requirements that most threaten the other side ...

...are exactly...

**dilemma**



# Deterrence requires belief that it is working...

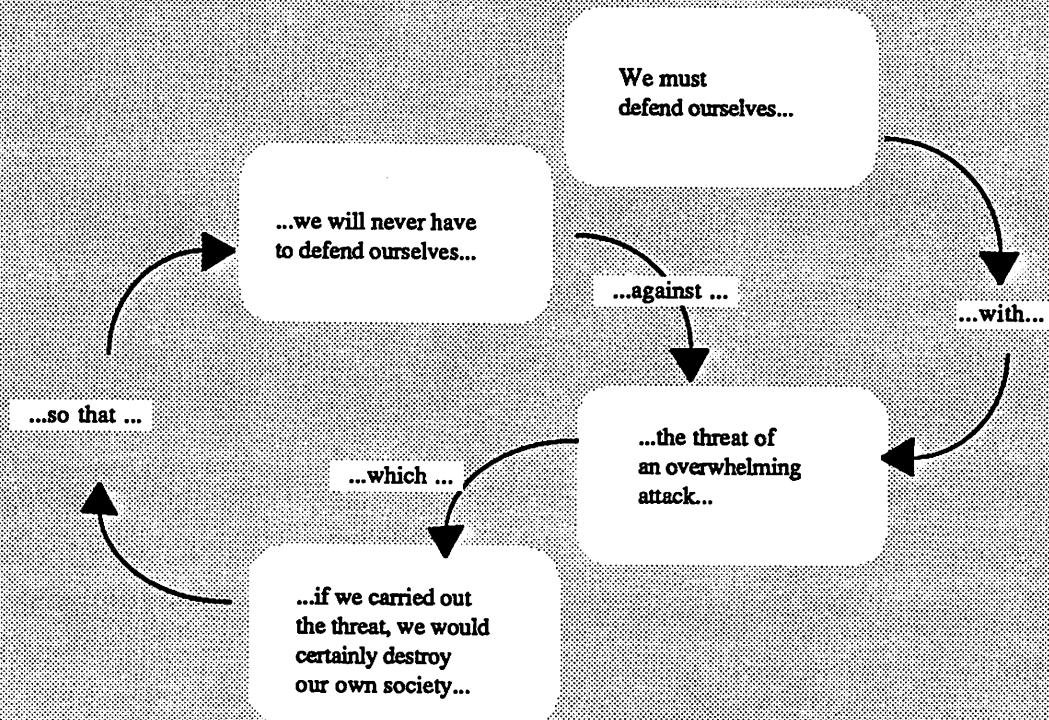


increases

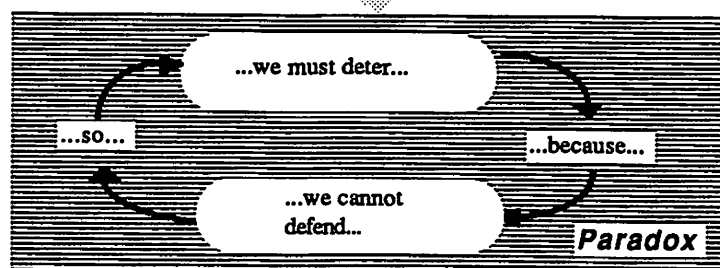
increases



To summarize, deterrence is now based on a basic paradox...

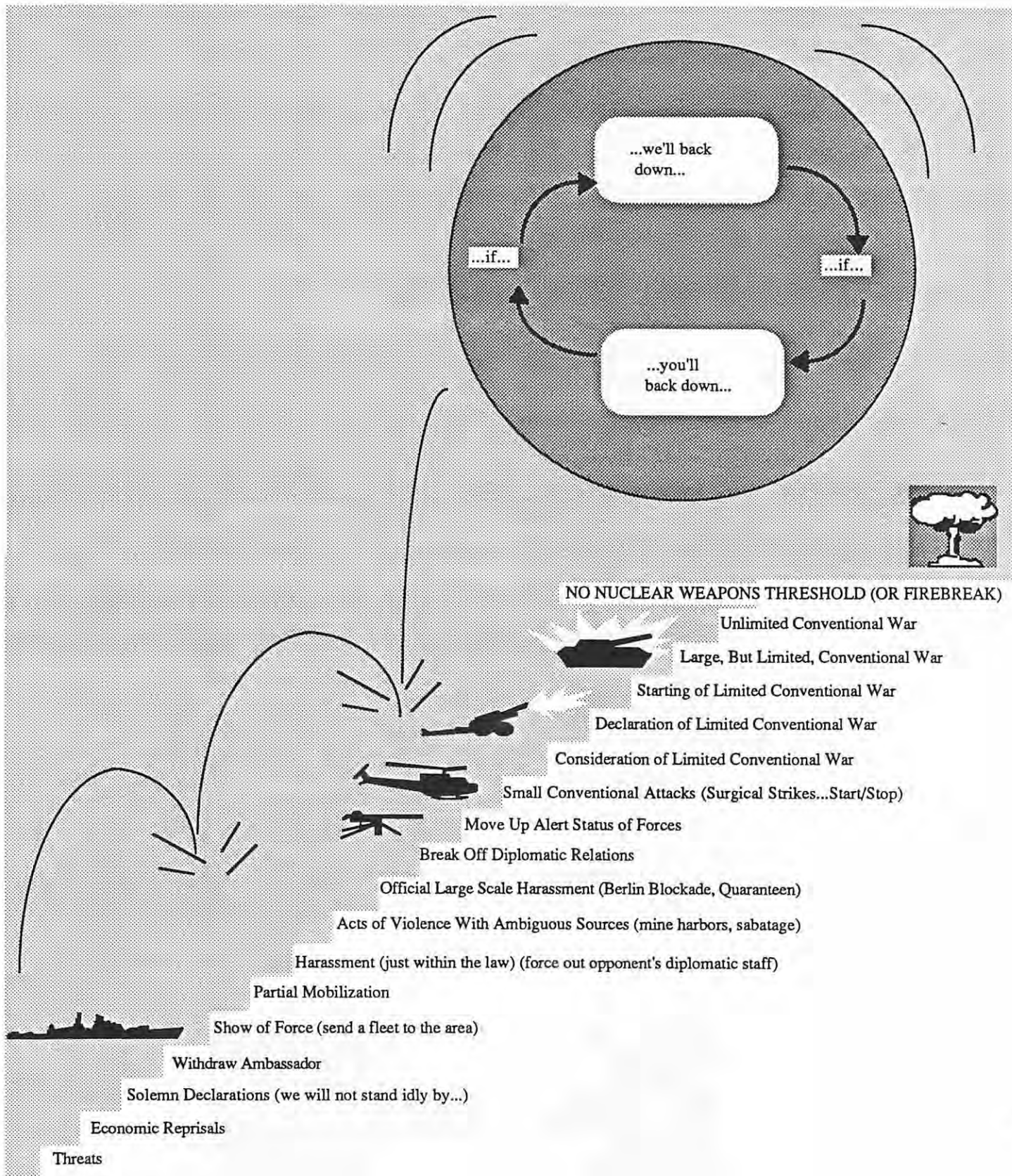


...this paradox is sometimes called the...



# Why is Deterrence So Dangerous?

In a severe confrontation, our survival depends on our leaders being able to solve the following dilemma at each stage on the escalation ladder...







?

ECOCATASTROPHE (NUCLEAR WINTER/AUTUMN)  
THRESHOLD (THE DOOMSDAY MACHINE) GENOCIDE

Full Scale Attacks on Cities

Full Scale Attacks on Military Targets

Electromagnetic Pulse (EMP) Attacks on  
Electronics of Communications Systems

Conventional or Nuclear Attacks on Warning and  
Intelligence Satellites

ATTACK ON HOMELAND THRESHOLD

Evacuation of 70% of People From Cities

Local Nuclear War

Declaration of Limited Nuclear War



MORE THAN ONE NUCLEAR EXPLOSION THRESHOLD (CRISIS STABILITY "Use them or lose them" THRESHOLD)

Very Limited "Counter Force" Attack (one or two bases)

Remote Demonstrations of Nuclear Explosions in Desert or Mountains ("Warning Shots")

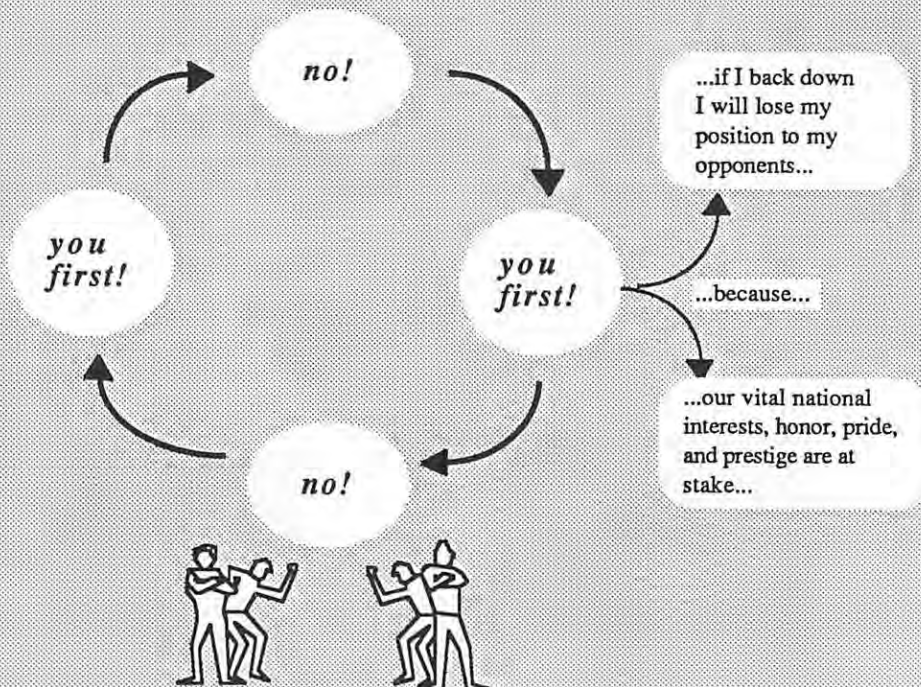
Limited Evacuation (Approx. 20 %)

Nuclear Ultimatums

Warnings of Disaster of Nuclear War ("It can get out of control. No one can be certain where it will lead.")

"Accidental" or "Unauthorized" Use of One Small Nuclear Weapon ("We didn't mean it and the officer will be punished")

...otherwise depicted as the "you first" loop...

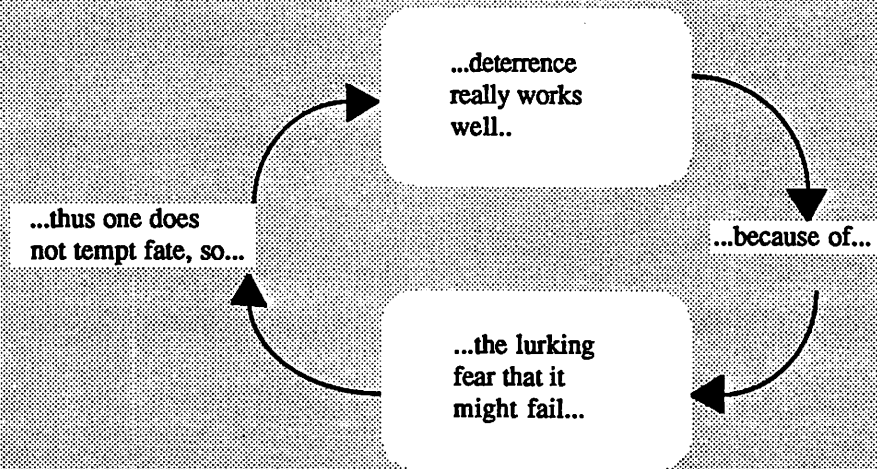


# Why does <sup>nuclear</sup> deterrence seem to work?

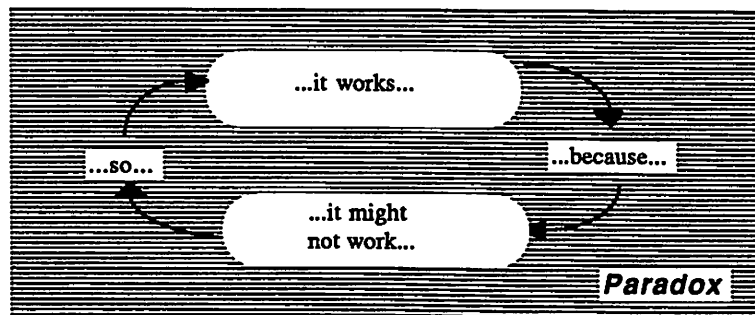
Early in the nuclear age,  
Bernard Brodie, a leading strategist,  
stated a basic contradiction  
that lurks beneath every  
discussion of nuclear strategy...

"It is a curious paradox of our time  
that one of the foremost factors making  
deterrence really work and work well  
is the lurking fear that in some massive  
confrontation crisis, it might fail.  
Under these circumstances, ones does  
not tempt fate."

## The Brodie paradox...



...this paradox is sometimes called the...





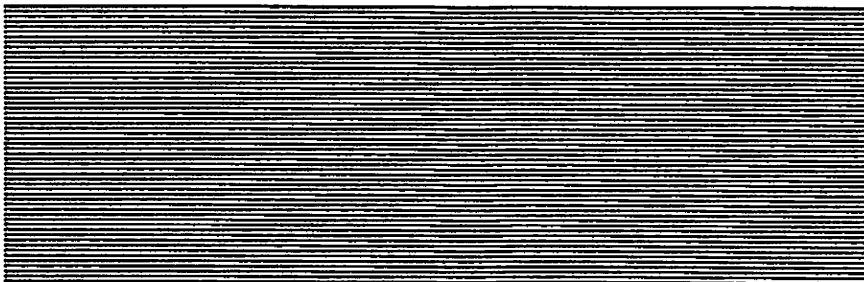


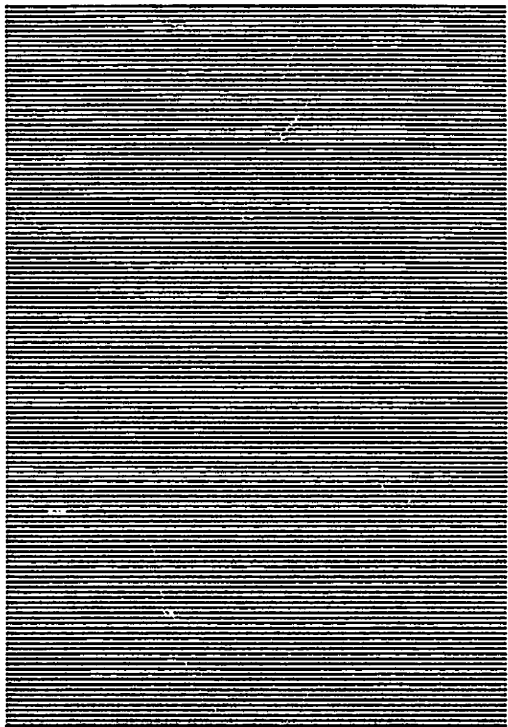
## **Chapter 3.**

# **Questioning Deterrence**

**The credibility of deterrence has recently come under intense questioning. This chapter presents a survey of this approaches...**

**...can credibility be maintained?**





*A rational strategy for the employment of nuclear weapons is a contradiction in terms. The enormous destructive power of these weapons creates insoluble problems. For this reason, much of the history of nuclear strategy has been a series of attempts to find a way out of this predicament and return to the simpler, more comforting prenuclear world in which safety did not depend on the adversary's restraint.*

Robert Jervis

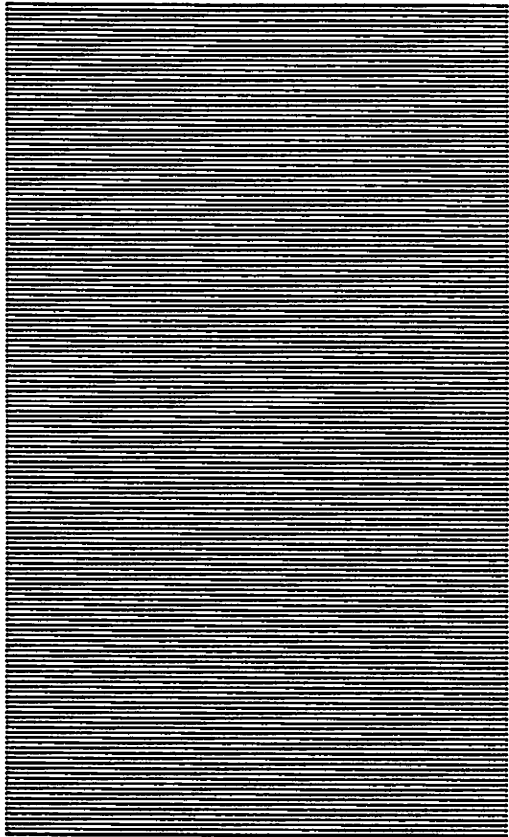
*... war is violence ... but it is planned violence and therefore controlled. And since the objective should be rational, the procedure for accomplishing that objective should also be rational, which is to say that the procedure and the objective must be in some measure appropriate to each other.*

Karl von Clausewitz

*If you desire peace, understand war.*

Basil Liddell Hart





*To begin with, there is the paradox of deterrence: the only way to avoid ultimate conflict--general nuclear war--is to be prepared to respond with overwhelming force to an attack against which there is no adequate defense. We must deter because we cannot defend, in a war that no one can win. If we are ever forced to employ our nuclear weapons, both we and our adversaries will have lost.*

Adam Yarmolinsky and  
Gregory D. Foster

*Thus far, the chief purpose of our military establishment has been to win wars. From now on, its chief purpose must be to avert them.*

Bernard Brodie



*The Problem with  
Assured Destruction*

Should a President, in the event of a nuclear attack, be left with the single option of ordering the mass destruction of civilians, in the face of the certainty that it would be followed by the mass slaughter of Americans? Should the concept of assured destruction be narrowly defined and should it be the only measure of our ability to deter the variety of threats we may face?



## ***Nuclear Famine Would Follow Nuclear Autumn or Nuclear Winter***

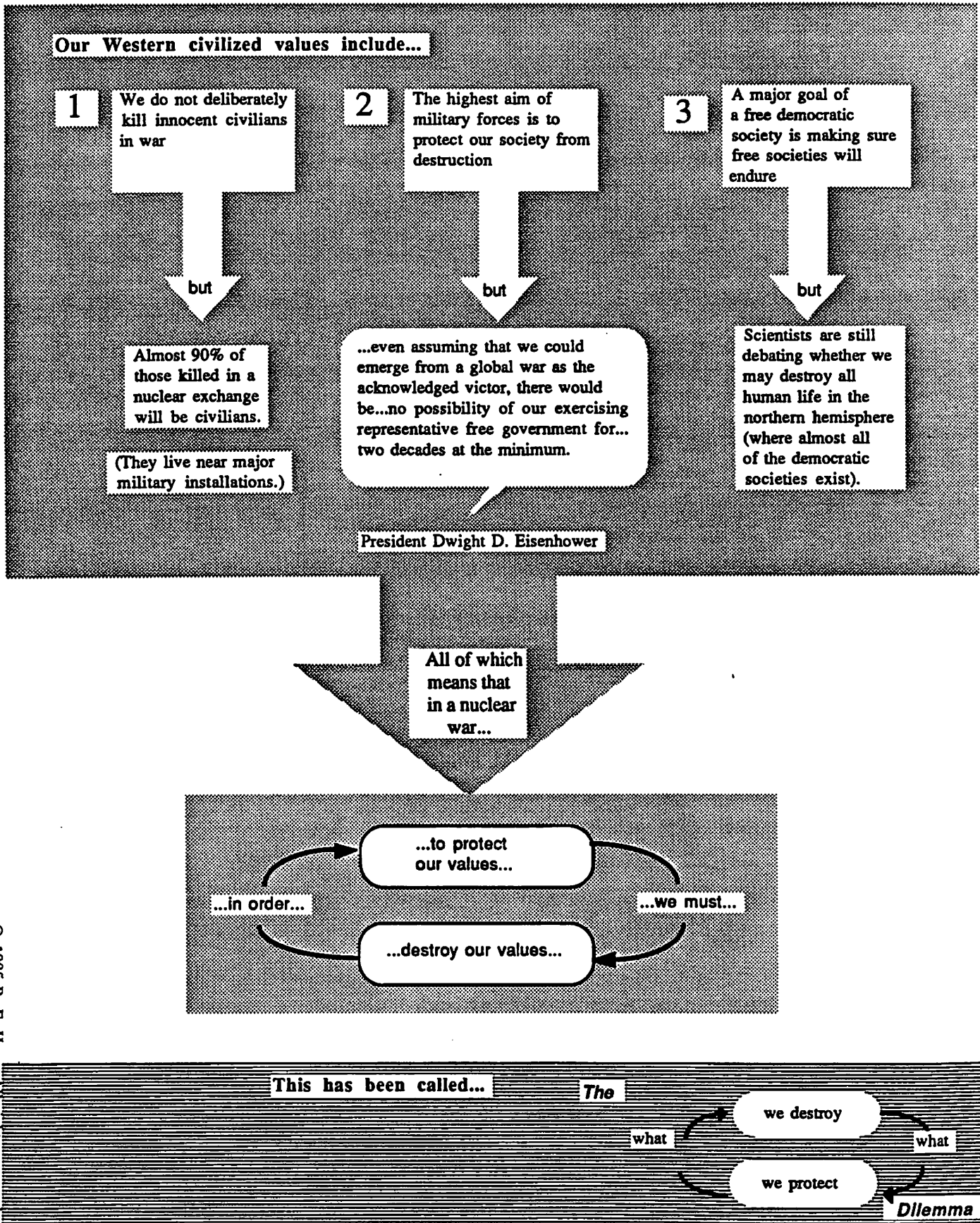
...consequently, the majority of the Earth's human population is vulnerable to death from malnutrition and associated diseases following a large-scale nuclear war. These conclusions mean that the recent scientific debate over "nuclear winter" and "nuclear autumn" is essentially unimportant when the endpoint of real concern is considered (i.e. endpoint of human casualties rather than just the endpoints of immediate temperature reductions).

Dr. Mark A. Harwell

The New scientific findings imply that, in a superpower nuclear conflict, the entire population of the Earth could be in jeopardy and no country would be immune from destruction... While the most dire predictions for the aftermath of a nuclear war are not yet certain, at this time they are credible enough to influence international policy regarding nuclear weapons....In all realistic scenarios for the development and deployment of an SDI, the problem of nuclear winter is greatly aggravated as a result of likely enhancement of offensive forces in response to defensive systems, new instabilities introduced by the advantage of a first strike against opposing defensive elements, and increased danger to "soft" urban targets that are not amenable to effective strategic defense.

Dr. Richard Turco

# What would happen to our values in a potential nuclear war?



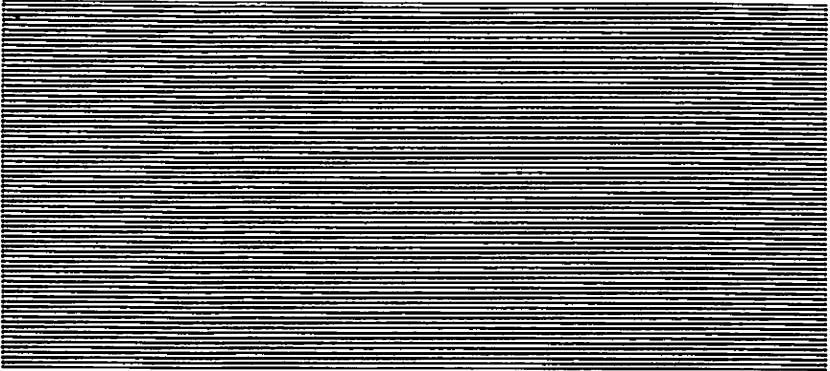
*We have no realistic idea how  
to replace deterrence...*

The deterrence paradigm has become an end game, a trap: we cannot let go of it because we have no realistic ideas how, and with what, to replace it . . . In the mean time, both sides go about the "normal science" of managing their respective deterrence strategies, a dangerous and expensive business.

***Tempted to Search for Ways to  
Greater Control Over Their Fate...***

A doctrine of mutual deterrence, implemented in this way [threats to cities], requires nations to live for the rest of history with their survival entirely dependent of the good sense and restraint of their opposite numbers. Such a system seems unlikely to be one conducive to a relaxed international environment. A sudden change in government, an unexpectedly severe crisis, may overturn all expectations. Rich and inventive nations will surely be continually tempted to search for technical or doctrinal ways of reasserting greater control over their fate.





*...immorality is inherent in the very possession of tens of thousands of nuclear weapons, whatever the doctrine. There is no conceivable way that these can be used without mass slaughter on an incalculable scale, and no theoretical sophistry can eliminate this basic fact."*

Jonathan Schell, *The Abolition*

*"We have said a clear and unconditioned 'no' to nuclear war and to any use of nuclear weapons. We have concluded that nuclear deterrence is a position which cannot receive the church's blessing....the ideology of deterrence must not receive the churches' blessing, even as a temporary warrant for holding on to nuclear weapons. The lingering possession of such weapons for a strictly limited time requires a very different justification: an ethic of reciprocity as nuclear-weapon states act together, in agreed stages, to eliminate their nuclear weapons."*


The Bishops of the United Methodist Church (1986)

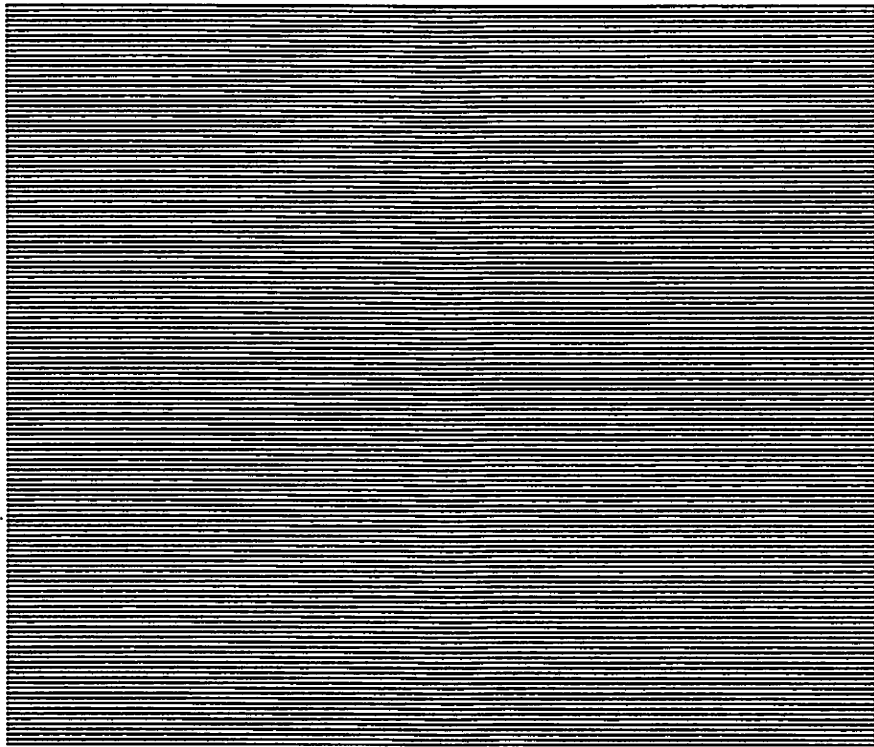
*I shall argue that the morality of nuclear deterrence is conditional. Deterrence as a national strategy cannot be absolutely justified or condemned without further evidence about motivations and likely results... I have drawn from the just war doctrine of the past to suggest a "just defense doctrine" for the nuclear age. I believe that such a doctrine can provide a moral compass for choices as well as a sense of hope for the future. Without such hope, we may fall prey to a cynicism and nihilism that are deeply corrosive to our lives as moral beings.*

Joseph S. Nye, Jr.  
in *Nuclear Ethics*

*"When you give conditional acceptance to <sup>d</sup>eterrence, you have committed yourself to stay in the nuclear debate, because you obviously have to measure whether your conditions are being met."*

Father J. Bryan Hehir  
Secretary of the Catholic  
Department of Social Development  
and World Peace





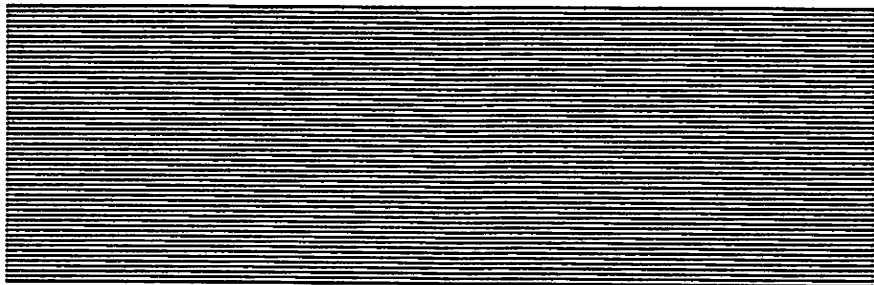
## **Chapter 4.**

### **The Ethical Debate**

**The concept of deterrence has come under intense scrutiny in the past decade by catholics and protestants alike.**

**...Is it ever ethical to use nuclear weapons?**

**...Can it be ethical to threaten their use?**



# How to use these charts

The charts on the following pages present the various arguments pro and con about the possible uses of nuclear weapons. The

reader is advised to trace through the arguments one at a time. On the facing pages are quotes from one or more of the major persons or organizations in the public discussion.

## Chart number and title

Each of the major arguments and rebuttals is covered on each chart.

## Introduction to the chart

Gives general background about the chart.

## Implications and direction of argument

Each box gives a claim ground, backing or warrant for the argument.

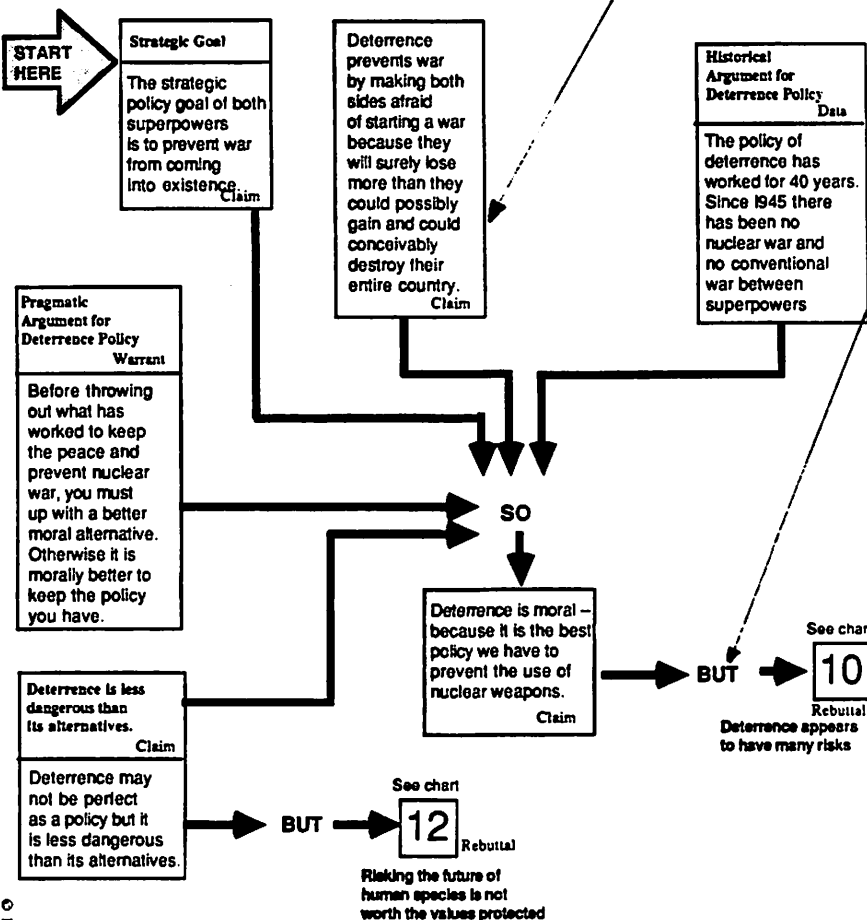
## Rebuttals

When there is an important counter-argument, these are indicated by a "but."

### 3 Deterrence prevents war; therefore is morally acceptable.

Some argue that deterrence is the best, and most moral policy a superpower can pursue today, because it is the most practical,

realistic policy to prevent the outbreak of nuclear war. This chart outlines the reasoning for that position.

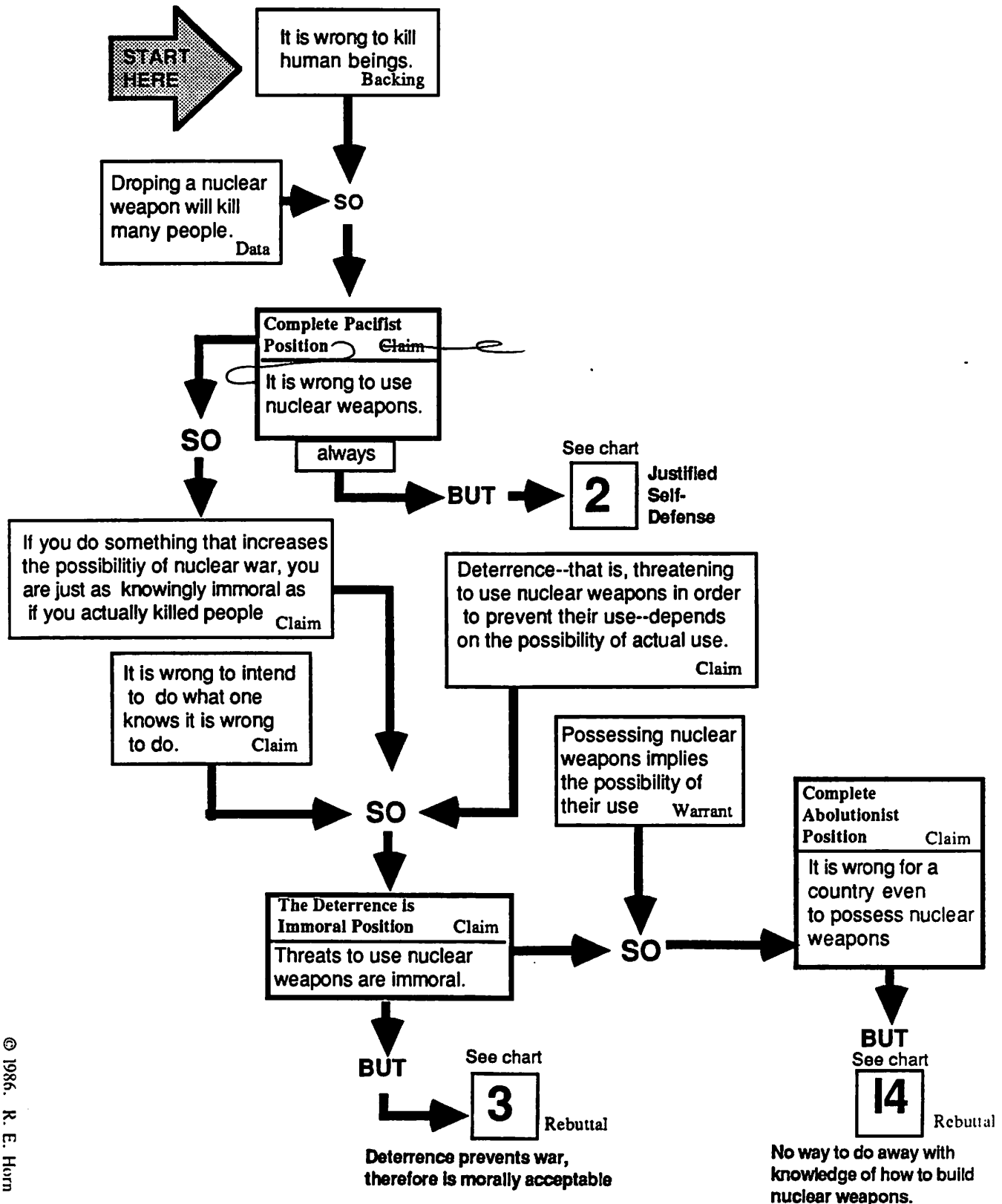


1

# It is wrong ever to use nuclear weapons.

For many people, there is an absolute prohibition from killing people. The Bishops of the United Methodist Church and many Quakers

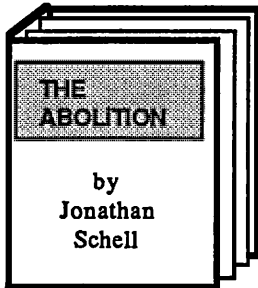
take this position. It is a consistent, principled belief that personal peacefulness will lead to world peace.



# Who Thinks So?

To understand the complete abolitionist position in greater depth, you can read the publications listed below. We provide some key quotes,

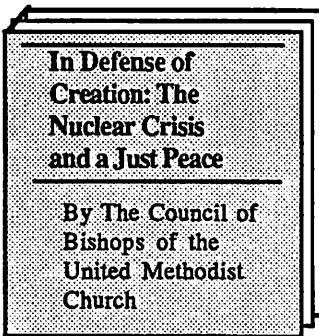
but these are no substitute for getting the full flavor of the author's ideas and feelings from the original text.



(New York, Knopf, 1984)

Jonathan Schell argues that...

"immorality is inherent in the very possession of tens of thousands of nuclear weapons, whatever the doctrine. There is no conceivable way that these can be used without mass slaughter on an incalculable scale, and no theoretical sophistry can eliminate this basic fact." (Schell, *The Abolition*, p. 56.)



(1986)

The Bishops of the United Methodist Church said in their pastoral letter (1986):

"We have said a clear and unconditioned 'no' to nuclear war and to any use of nuclear weapons. We have concluded that nuclear deterrence is a position which cannot receive the church's blessing....the ideology of deterrence must not receive the churches' blessing, even as a temporary warrant for holding on to nuclear weapons. The lingering possession of such weapons for a strictly limited time requires a very different justification: an ethic of reciprocity as nuclear-weapon states act together, in agreed stages, to eliminate their nuclear weapons."

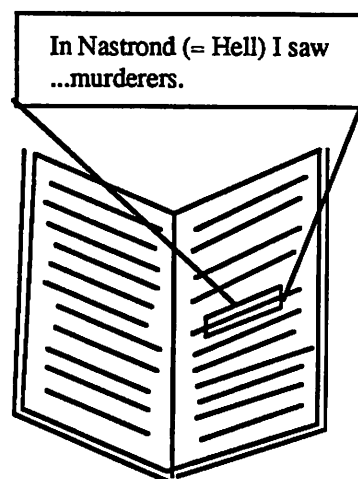
## The 10 Commandments

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
- 6 Thou Shalt Not Kill.
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

Ancient Hebrew, from  
The Book of Exodus XX,  
13.



Ancient Egyptian,  
From the Confessions  
of the Righteous Soul,  
in The Book of the Dead.



Old Norse, from the  
Volospa. 38,39.

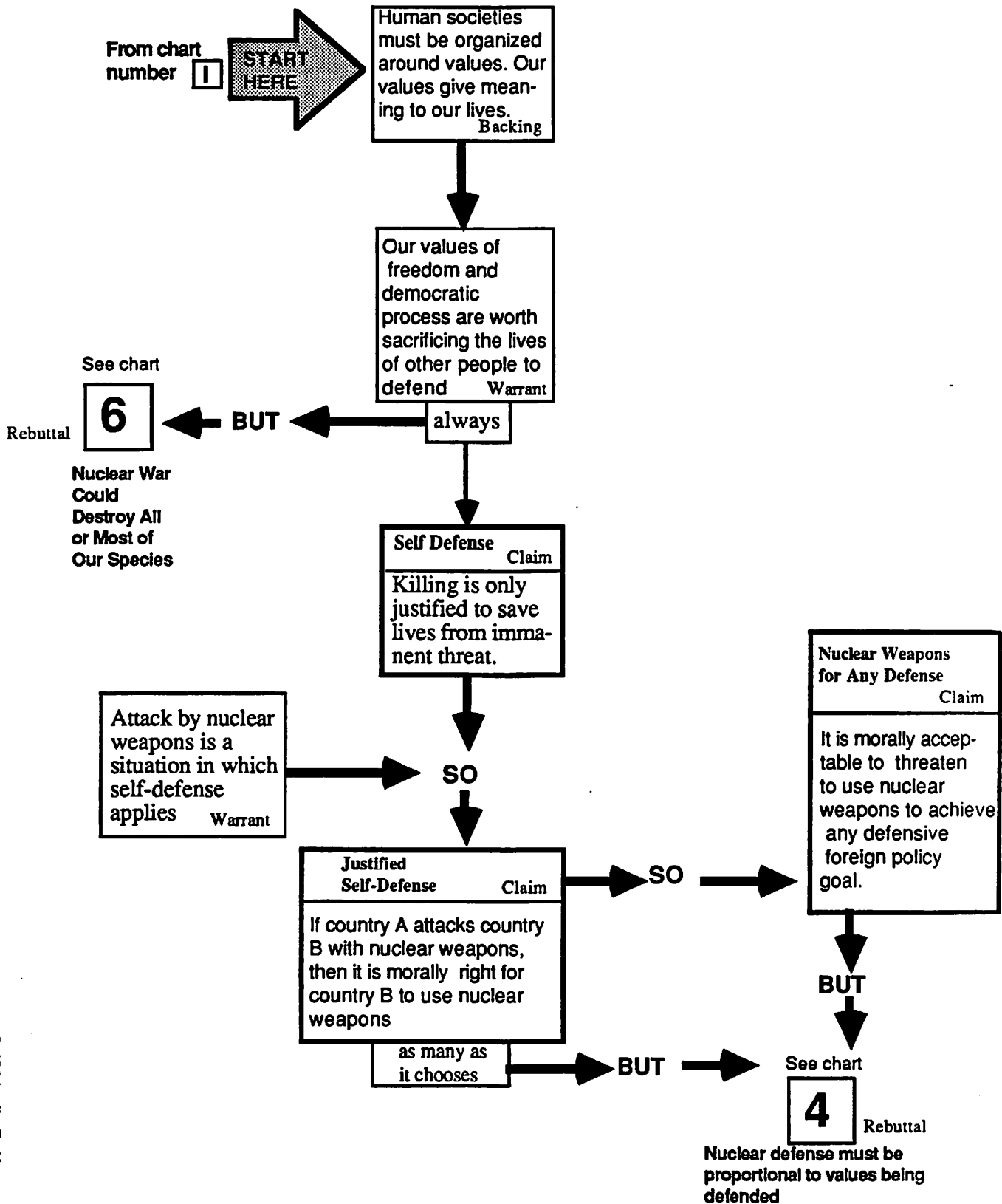


# 2

## Justified Self-Defense

It is the position of many, including the Bishops of the Roman Catholic Church that the idea of justified self-defense can be applied to the

morality of using nuclear weapons. They say that in very limited circumstances such weapons might be used.



**Deterrence prevents war; therefore is morally acceptable.**

**realistic policy to prevent the outbreak of nuclear war. This chart outlines the reasoning for that position.**

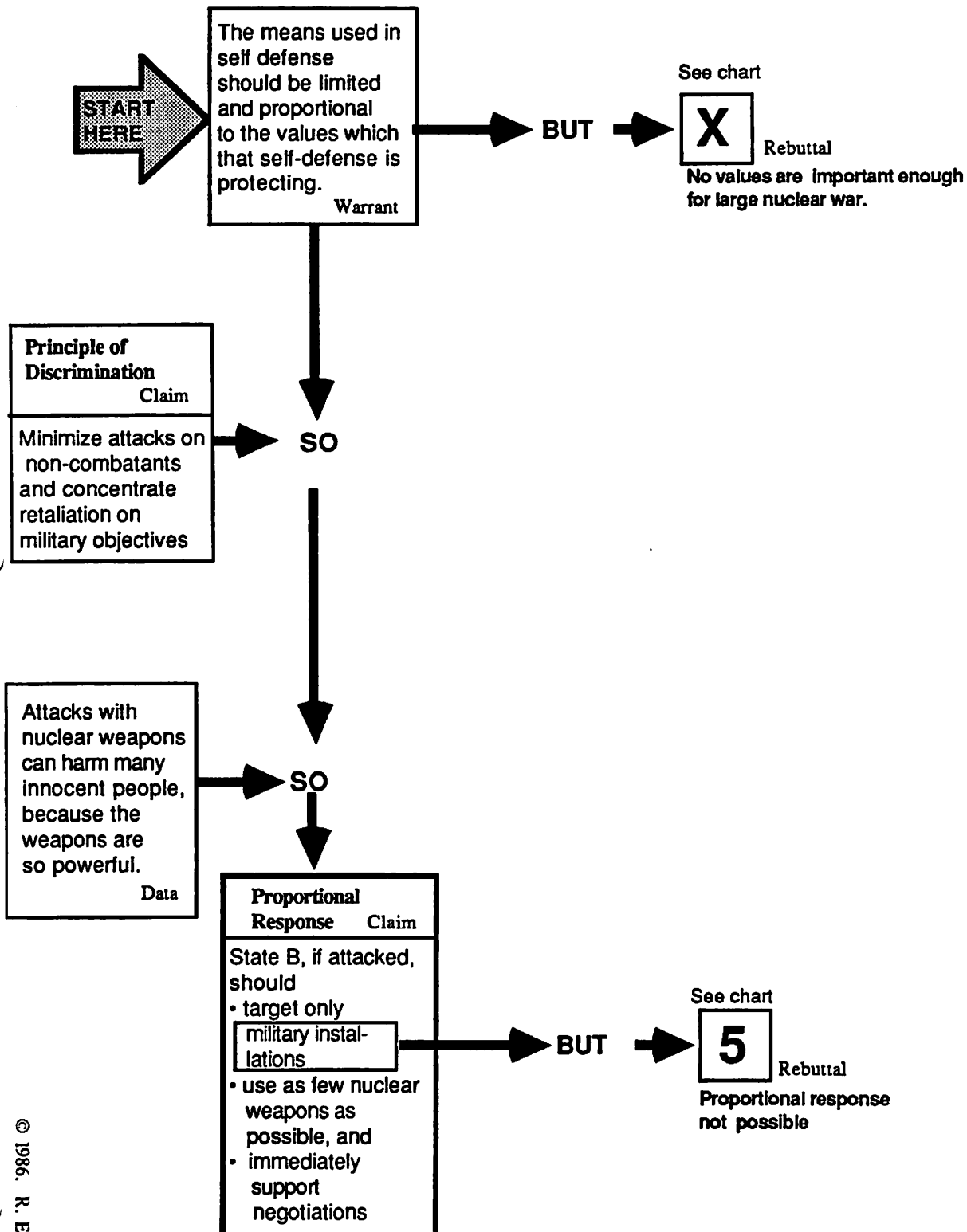


## 4

## Retaliation proportional to values defended.

The moral claim of justified self-defense is not unlimited. A country must not retaliate with an unlimited attack against any target civilian or

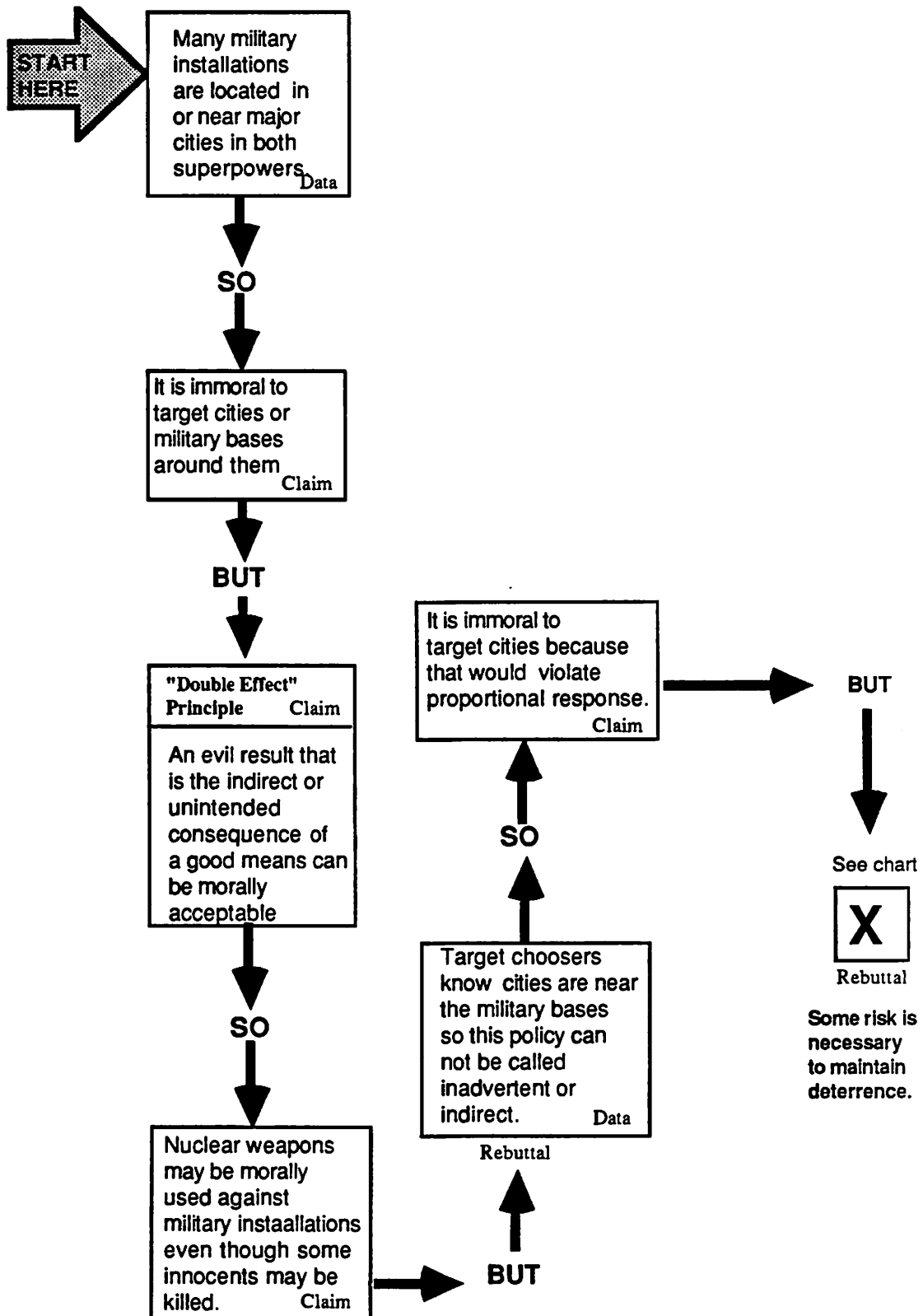
military. Rather the reply must minimize harm to non-combatants, innocents, and be proportional to values defended.



## 5 Proportional response not possible

Ideal moral policies sometimes are simply not implementable. A number of critics have pointed out that with the extreme power of

nuclear weapons, and with the inability to predict how much they can be controlled, that the policy of proportional response is unworkable.



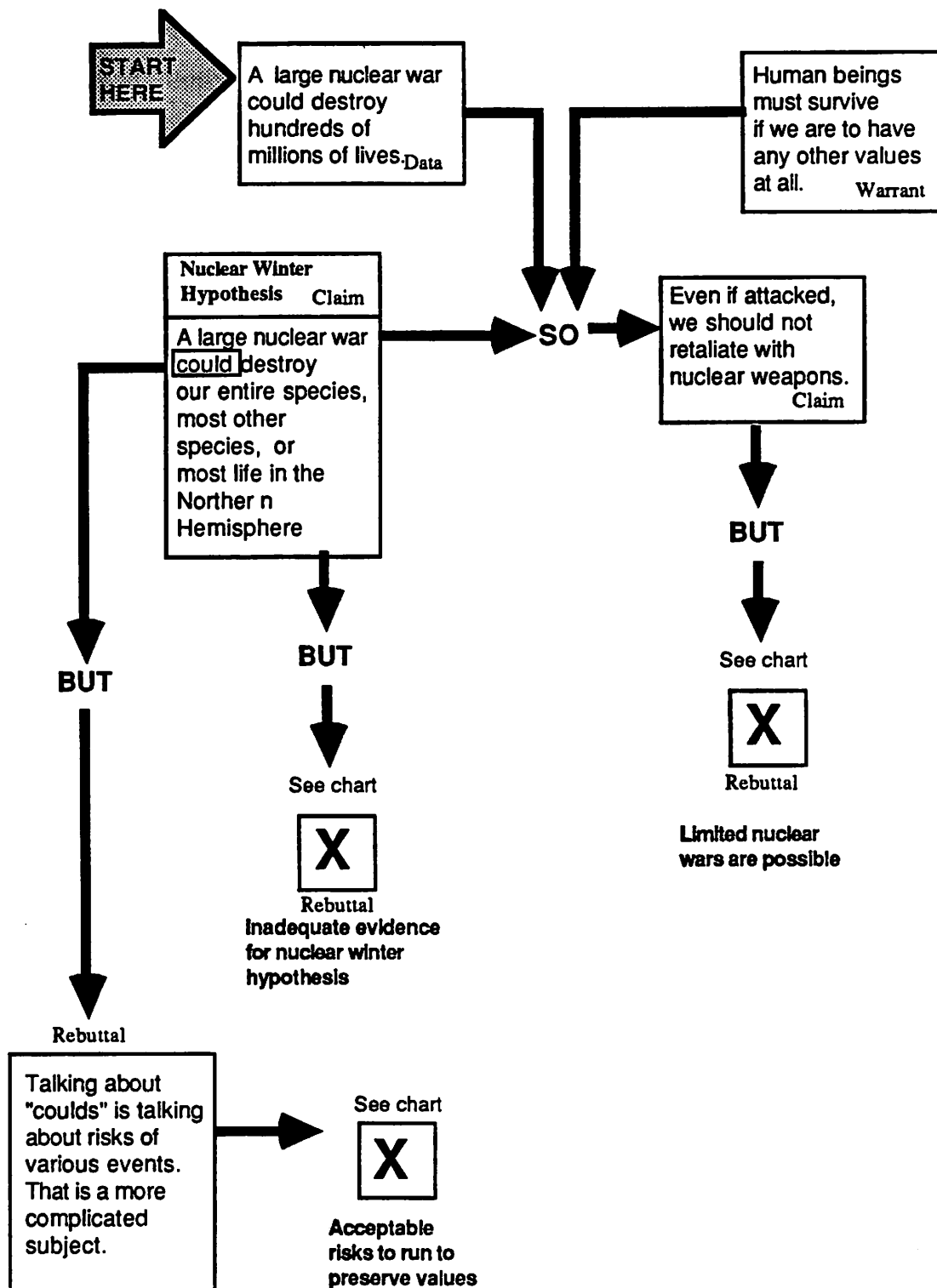


6

# Destroy all or most human beings

There is a current scientific debate as to exactly how much damage a large nuclear war would do. A significant group believes that it could result

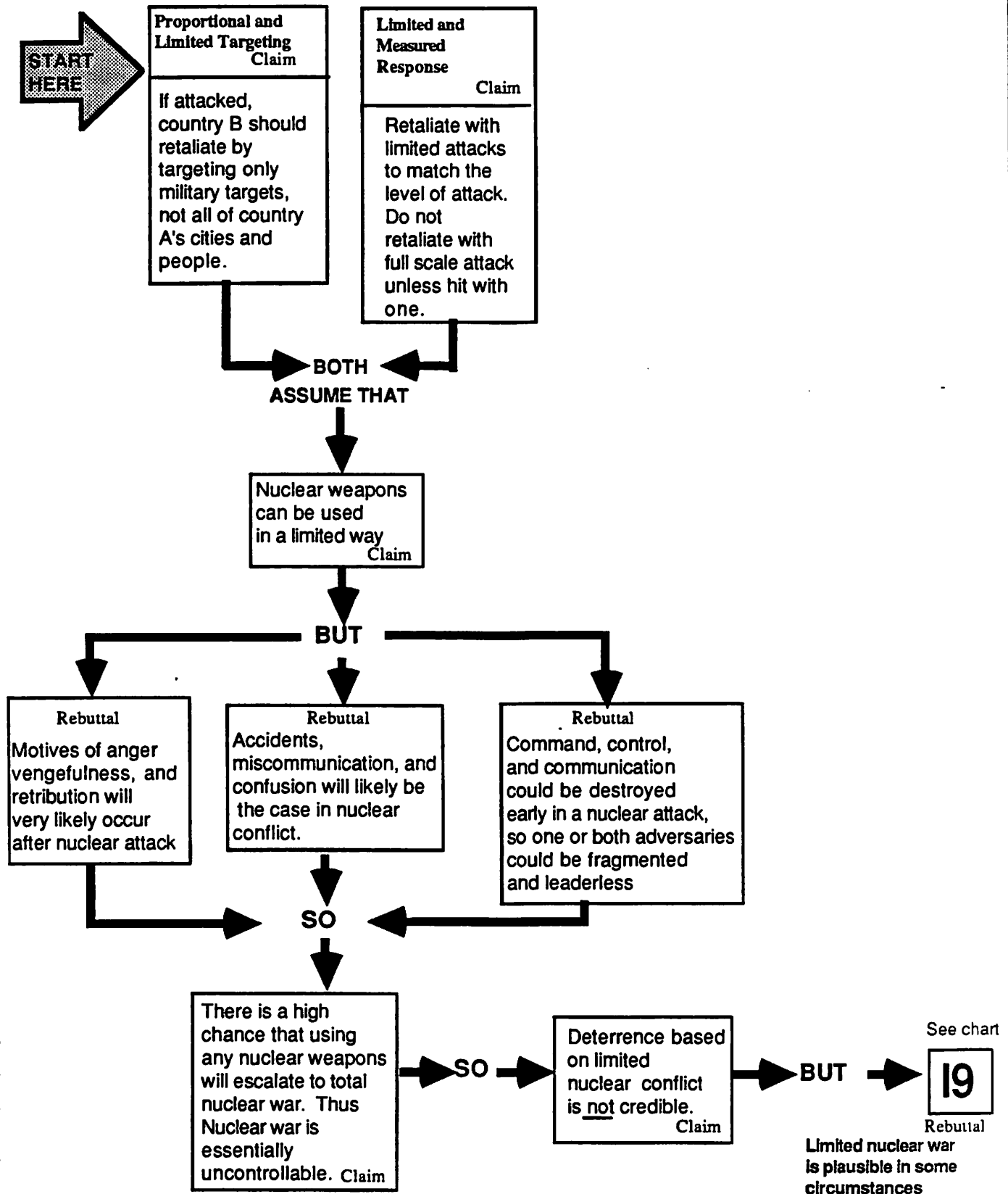
in the destruction of the entire human species or, at minimum, all life in the Northern Hemisphere. This is called "nuclear winter."



# 7 Limited nuclear war is not possible

Considerable dispute has taken place as to whether the use of nuclear weapons can remain limited and controlled, once a conflict

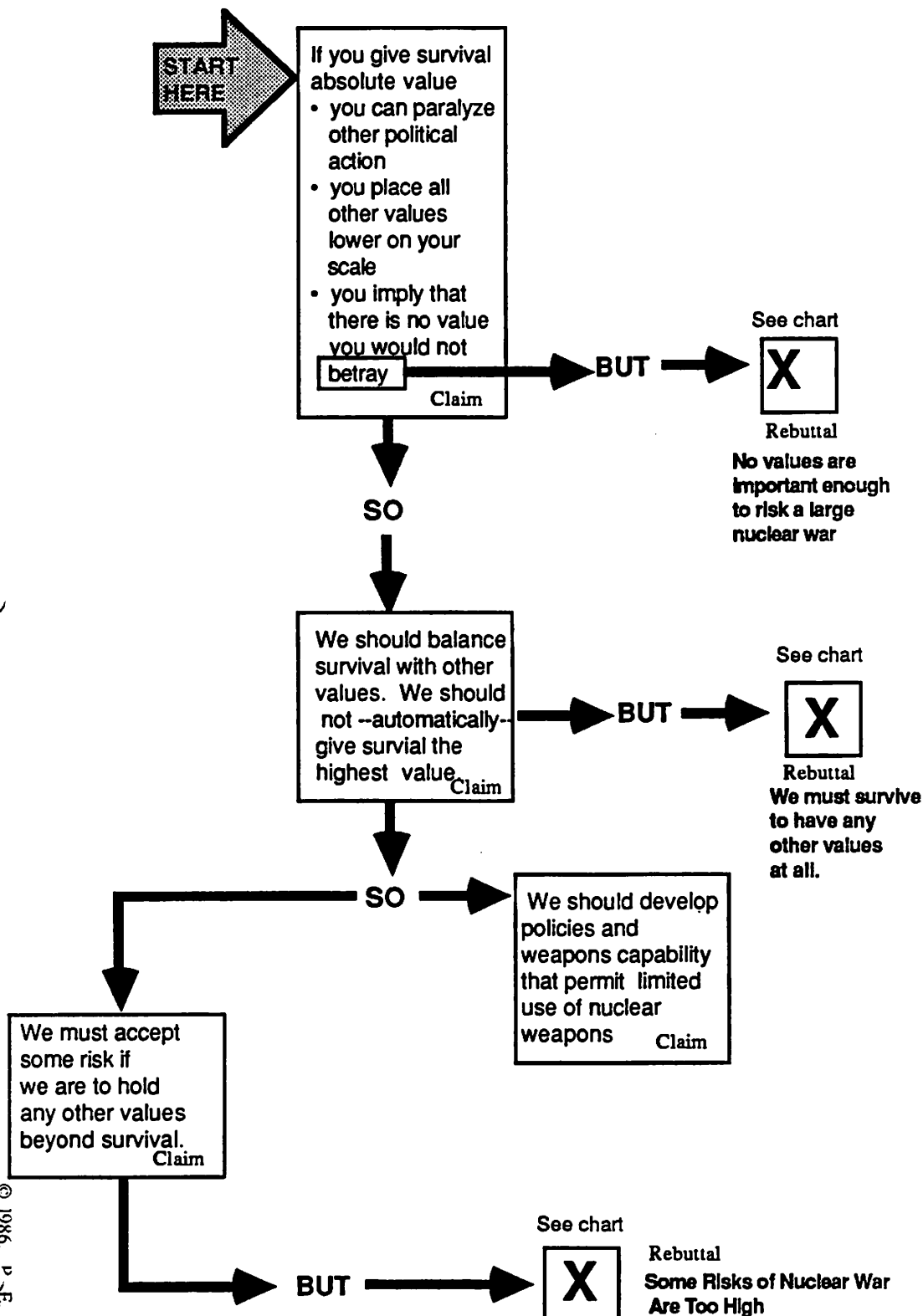
has broken out. One group says that we have to plan and procure so we can fight limited nuclear wars; others say such wars are implausible.



## 9 All policies have risks

Some argue that humanity must not give absolute weight to any single value, e.g. survival. But rather we must balance risks

and gains of any policy. All policies run some moral risks, according to this view. We must determine exactly what they are and weight them.

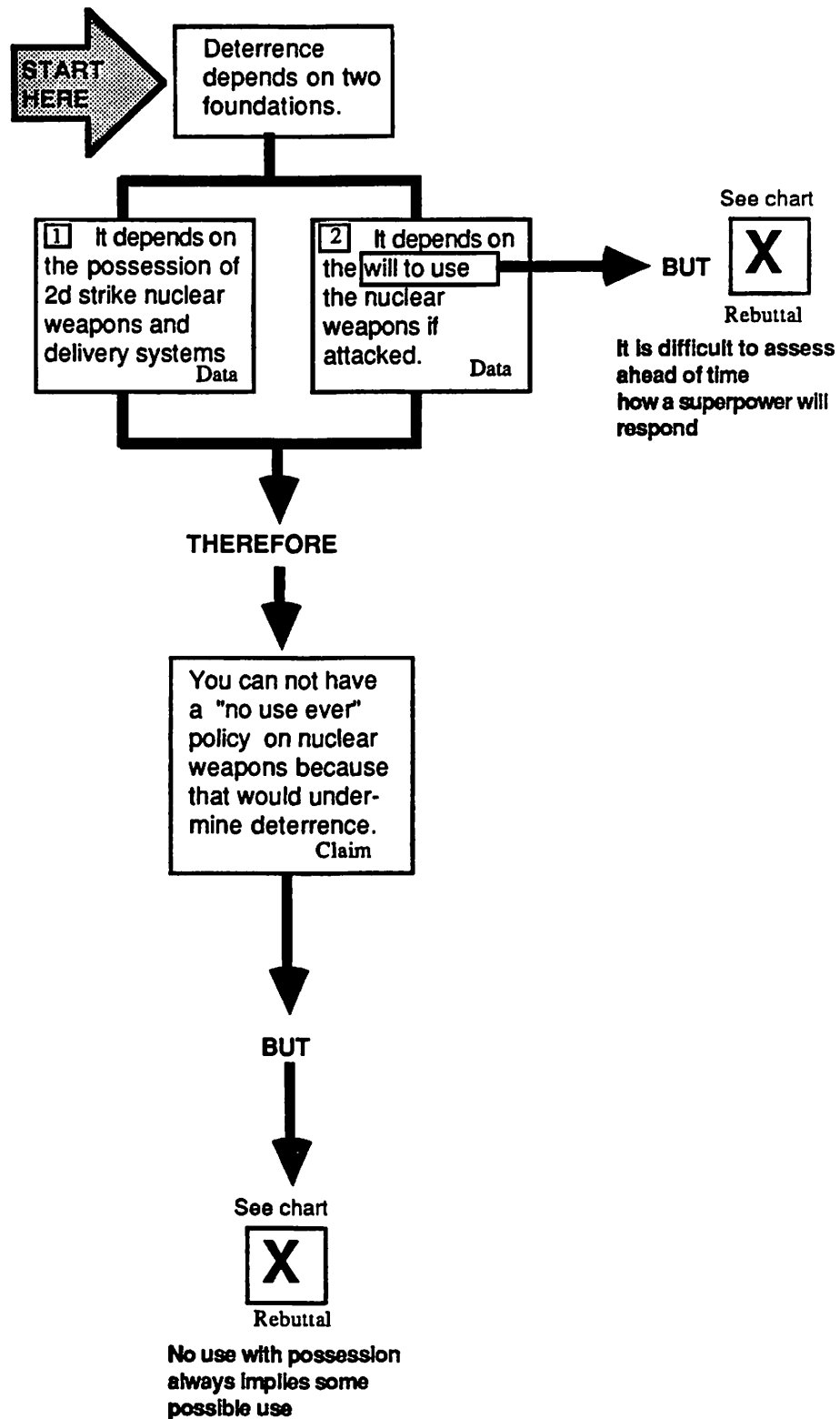


10

# Deterrence Requires Targets and Will

Some reject to the Idea that nuclear deterrence must be rejected as policy

because it violates the principles of proportionality and discrimination.







# In a crisis, stable deterrence is best policy.

One of the ways of approaching the the ques-  
tions of nuclear ethics is to ask, "Which moral  
policy would make war more likely if the two

superpowers were in a crisis situation?" This  
question yields somewhat unexpected moral  
discourse.



Consequences of  
bluff as a policy Claim  
In a crisis, if one side  
believes the other side  
would not actually  
use its nuclear  
weapons in a war,  
there would be  
no deterrence.

AND IF

The stakes in the  
confrontation were  
large enough to risk  
calling the bluff of the  
other nation, this  
would start a limited  
war. Warrant

SO

Since we now have a  
situation of stable  
deterrence, it is better  
to keep it robust, than  
to let it deteriorate into  
bluff. Claim

Robust deterrence  
decreases the  
risk of ever having  
a nuclear war. Claim

So, deterrence is a  
better means of achieving  
survival of both  
superpowers in a conflict,  
which is their ultimate  
strategic goal. Claim

Major change (e.g. nearly  
complete disarmament)  
would make limited war more  
likely and thus make the  
world less safe. Claim

BUT

See chart

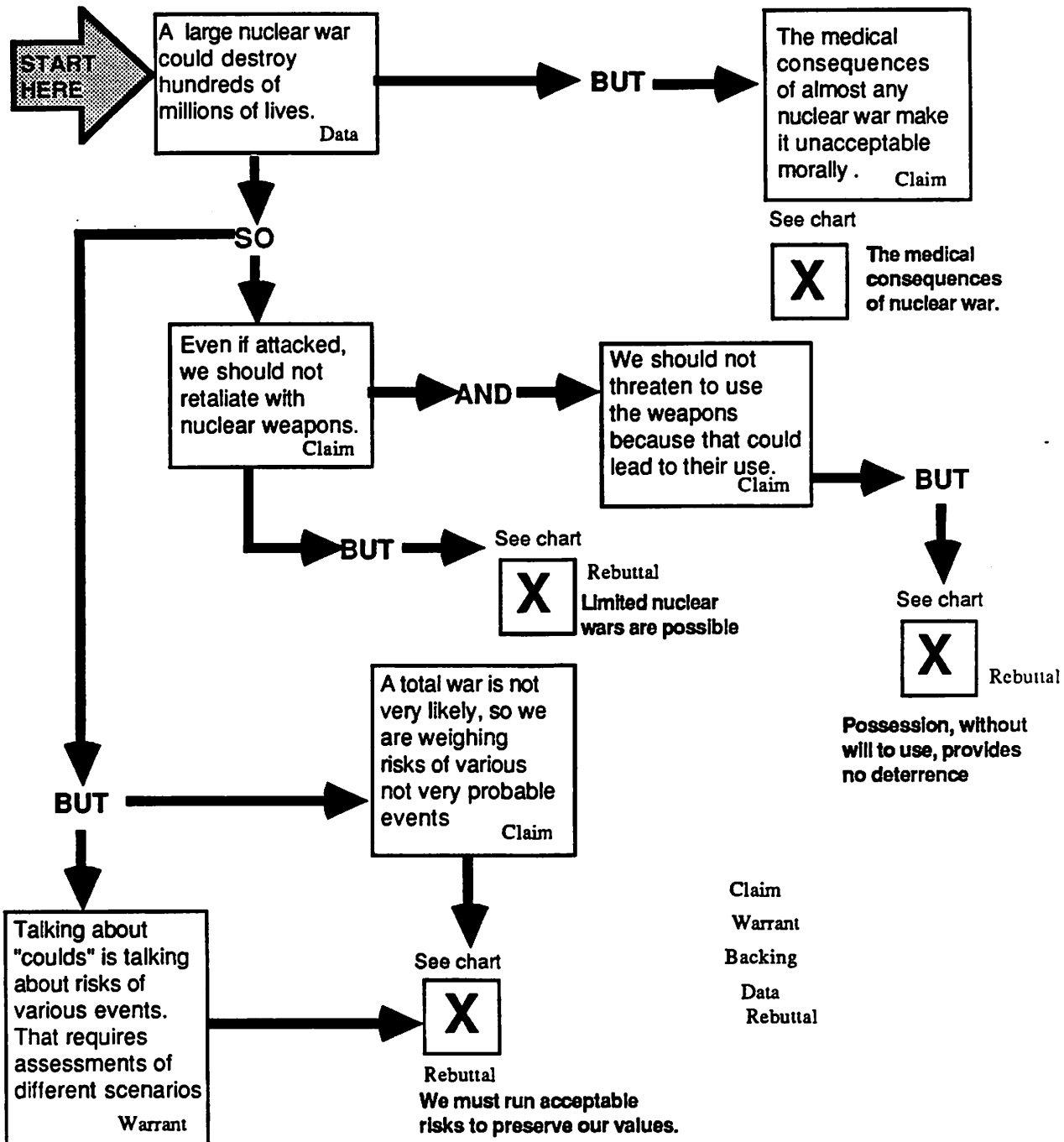


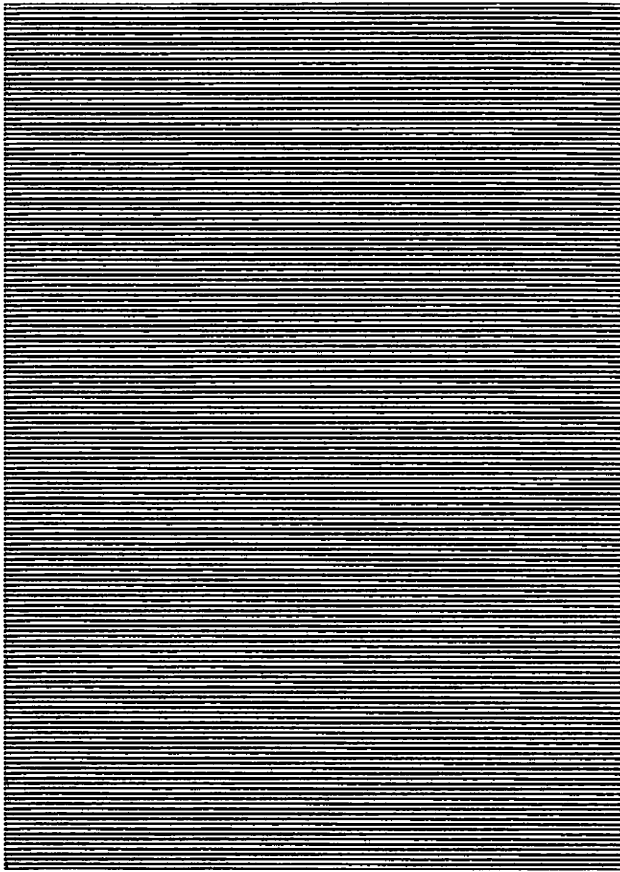
Rebuttal  
Deterrence is not  
moral as a long  
term policy

# Possess, but not threaten to use

There is a current scientific debate as to exactly how much damage a large nuclear war would do. A significant group believes that the superpowers

should keep their nuclear weapons at some level but never threaten to use them (and of course never actually use them.)



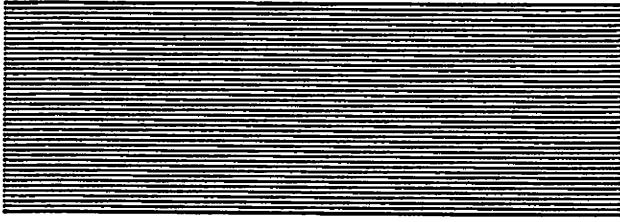


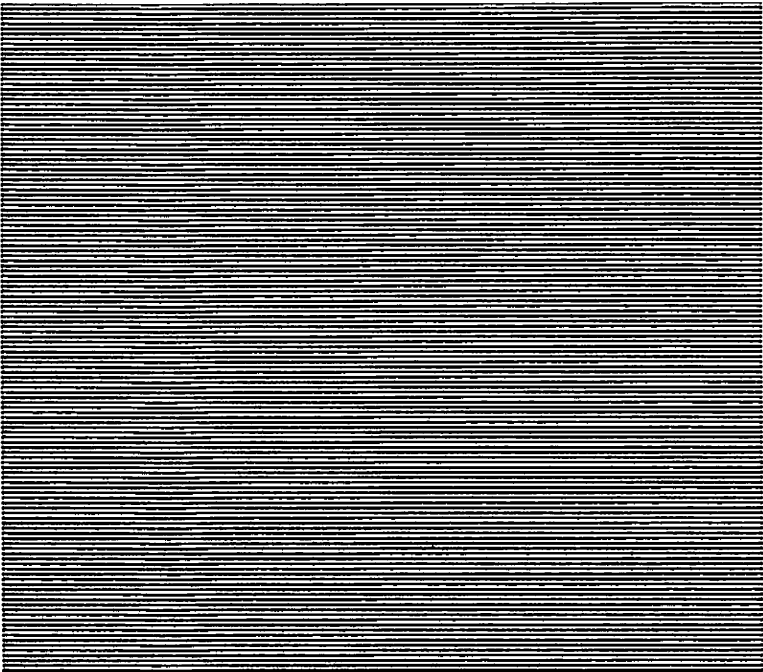
By conditioning military and political elites, on both sides, to act in accord with the first premise of adversary posture—to seek ceaselessly for advantage and to expect annihilating attack upon the first sign of weakness— [strategic doctrine] could tempt one side (if a manifest advantage should arise) to behave as theory prescribes, and to seize the opportunity for a preemptive strike. And what would the war, then, have been about? It would have been about fulfilling a theorem in deterrence theory.

E. P. Thompson

War is an act of force, and there is no logical limit to the application of that force. Each side, therefore, compels its opponent to follow suit; a reciprocal action is started which must lead, in theory, to extremes.


Carl von Clausewitz  
author of *On War*  
classic of modern strategy



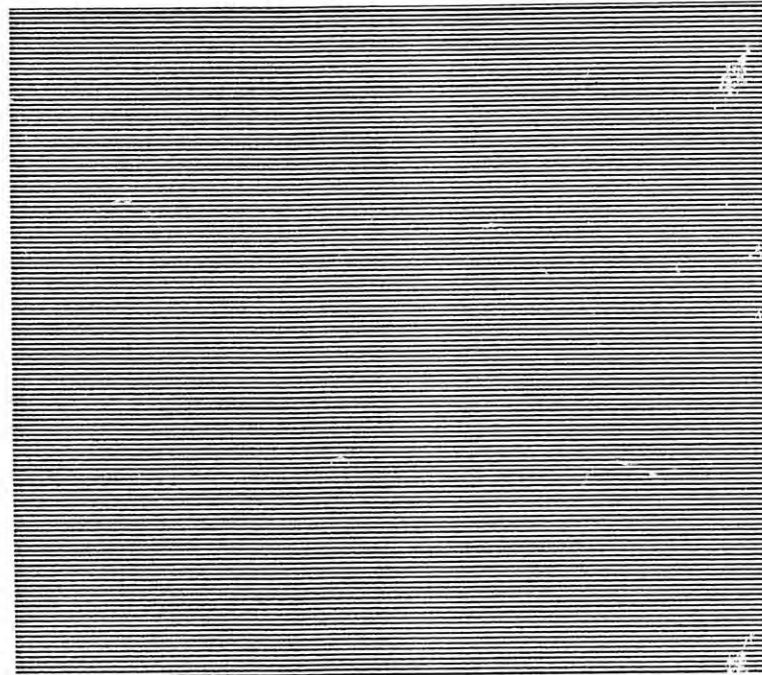


As the gravity of a crisis increases, past experience becomes progressively less relevant; comprehension of events more problematic; stress and fatigue on men, machines, organizations, and societies more severe; and control correspondingly less firm. Crisis "management," though indispensable, only seeks to cope with crisis. The Cuban Missile Crisis, and other successfully "managed" crises, have been tame confrontations in that they only involved marginal interactions between the superpowers' armed forces. It would be reckless to assume that those experiences imply that crises are manageable to the degree of confidence required by the existence of nuclear weapons. Prudence unambiguously dictates that avoidance and deterrence of crisis by sound diplomacy combined with a robust though unprovocative defense posture is the first and foremost priority.

from Crisis Stability and Nuclear War,  
a report published under the auspices of the  
American Academy of Arts and Sciences  
and the  
Cornell University Peace Studies Program

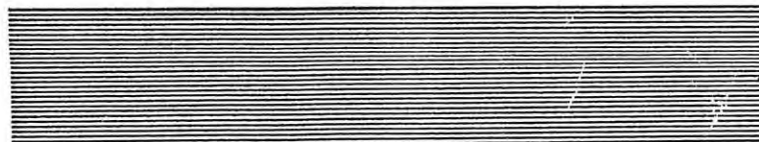


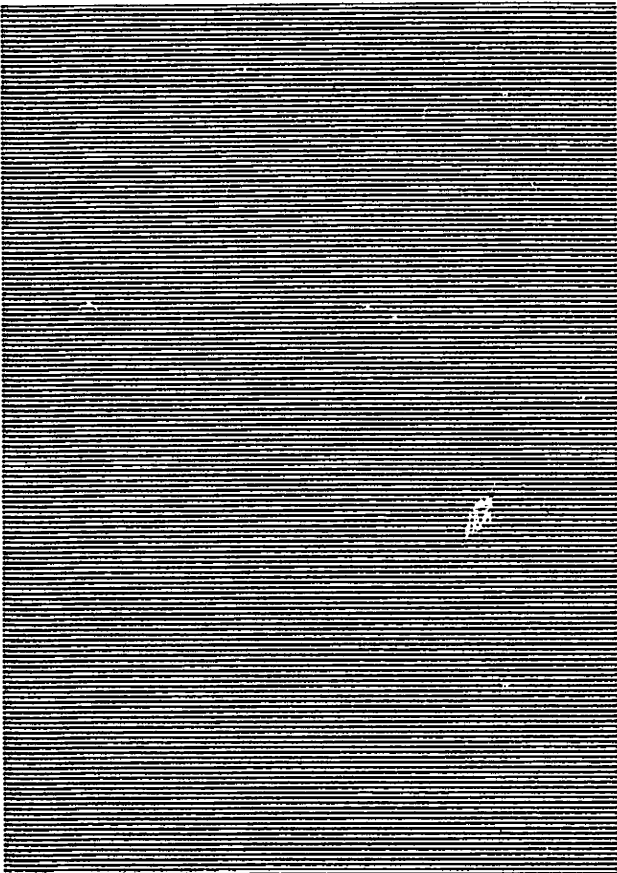




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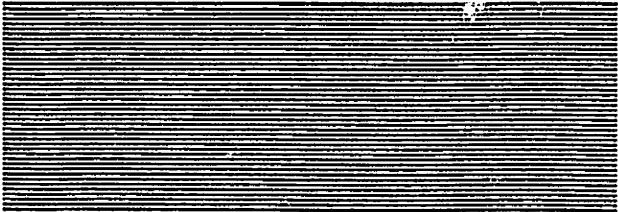


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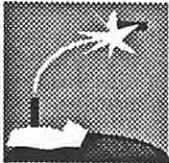


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Carl von Clausewitz  
author of *On War*  
classic of modern strategy



# Chapter 5. The Policies and Their Rebuttals

*This chapter presents a survey of the different policies that have been advanced to meet the challenges of the next phase of the nuclear age...*

1.  **Eliminating all nuclear weapons**
2. **Defending populations and cities from missile attack** 
3.  **Defending our ICBMs from missile attack**
4. **Increasing uncertainty, thereby improving deterrence** 
5.  **Other potential missions for missile defense**
6. **Stopping weapons testing and deployment** 
7.  **Arms control and conventional defenses assuming minimum feasible nuclear deterrence**



The proposed policy/strategy of...

# Eliminating all nuclear weapons...

Because...

...the greatest thing we have to fear is...

...any kind of nuclear war small, large, deliberate or miscalculated...

...because...

...such a war would destroy possibly hundreds of millions of innocent people and perhaps make the planet uninhabitable ...



...that would be immoral...

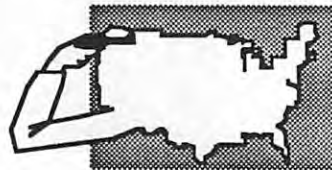
"We have said a clear and unconditioned 'no' to nuclear war and to any use of nuclear weapons. The lingering possession of such weapons for a strictly limited time requires a very different justification: an ethic of reciprocity as nuclear-weapon states act together, in agreed stages, to eliminate their nuclear weapons."

The Bishops of the United Methodist Church in their pastoral letter (1986)

"...immorality is inherent in the very possession of tens of thousands of nuclear weapons, whatever the doctrine. There is no conceivable way that these can be used without mass slaughter on an incalculable scale, and no theoretical sophistry can eliminate this basic fact."

Jonathan Schell, *The Abolition*

...that would be national suicide...



... national objectives cannot be consonant with national suicide, there is no use talking about a mutual exchange of nuclear weapons.

Bernard Brodie  
leading U.S. nuclear strategist  
Princeton University

...SO...

We seek the total elimination one day of nuclear weapons from the face of the Earth.

Ronald Reagan  
2d Inaugural Address

It should be our policy...

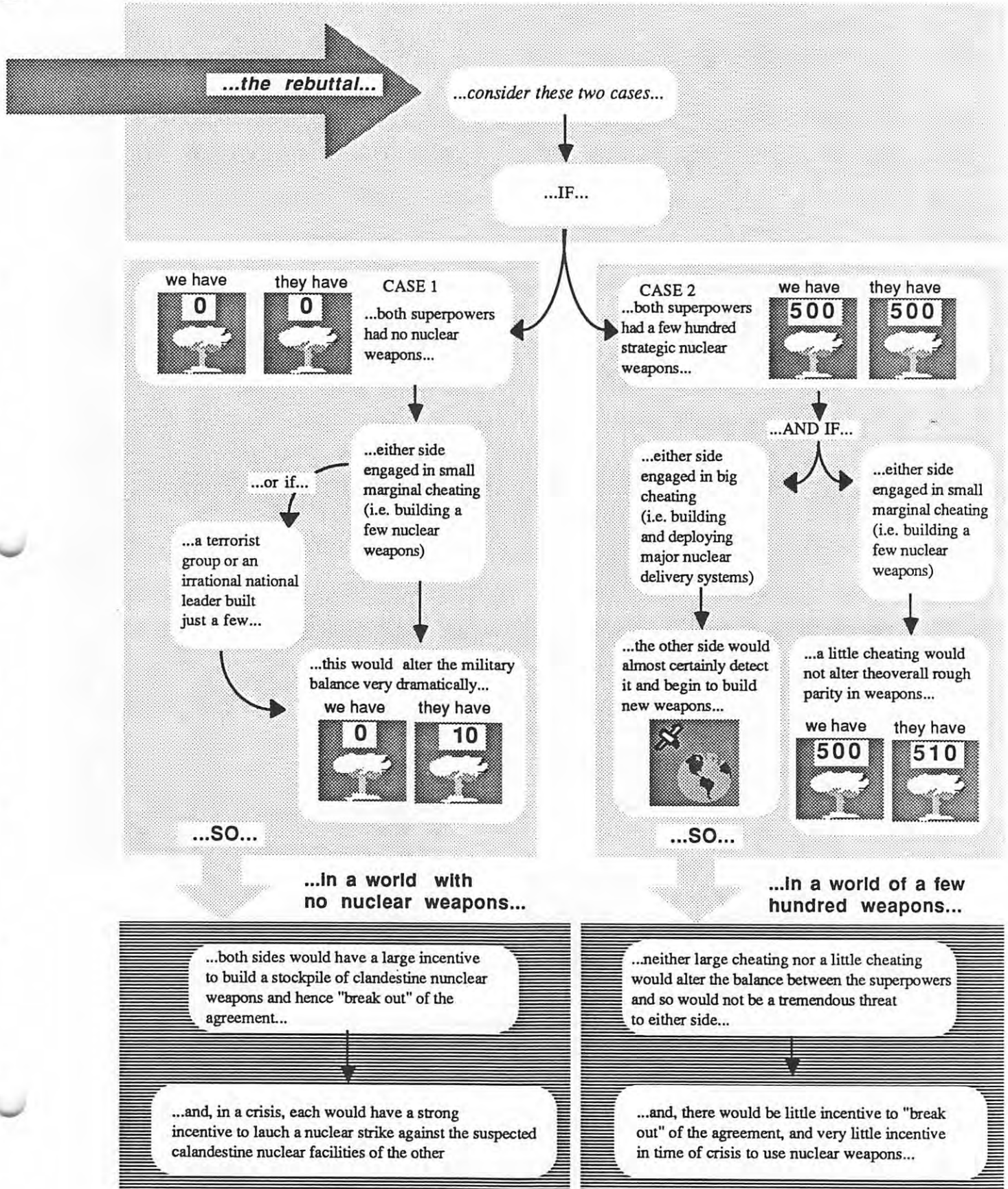
...to eliminate all nuclear weapons



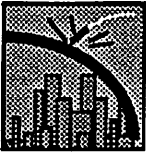
BUT, there is a rebuttal...



## ... and the "fear of cheating" rebuttal...

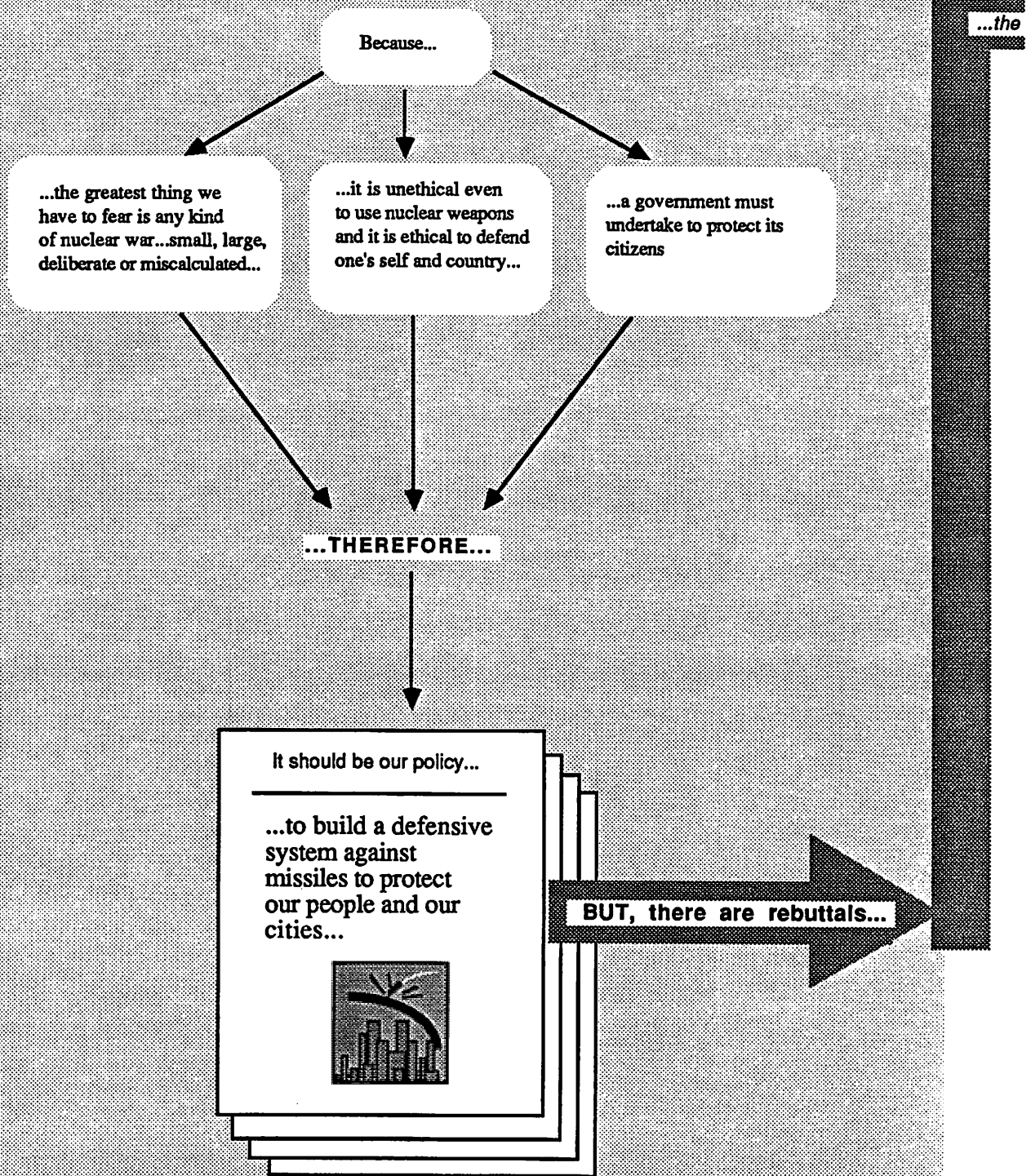






The proposed policy/strategy of...

# Defending Populations and Cities from Missile Attack



*... and the many rebuttals...*

**1.**

rebuttals...

**Nobody knows how to build a population defense in the foreseeable future...**

(To be written)

**2.**

**Testing would require abandoning the Anti-Ballistic Missile Treaty of 1972.**

(To be written)

**3.**

**It would be easy and less costly to build countermeasures**

(To be written)

**4.**

**A 90% defense for cities would be a 100% failure**

(To be written)

**5.**

**The cost would be enormous and much less than cost of overcoming it**

(To be written)

**6.**

**Such a defense wouldn't protect against bombers, cruise missiles or smuggling**

(To be written)

**7.**

**No computer system imaginable could be trusted to direct the defense system effectively the first time.**

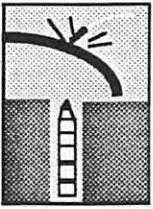
(To be written)

**8.**

**Even testing components would endanger our security by making our satellites vulnerable.**

(To be written)





*The proposed policy/strategy of...*

# Defending land-based missiles to deter counterforce first strikes against them...

Because...

...they could reduce the relative size of our strategic forces by a first strike directed only at our land-based missiles...

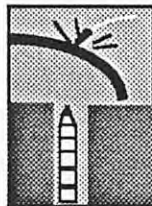
...and thus...

...they could say to us, do not retaliate because if you do, we will strike your cities with our reserve force...

...SO...

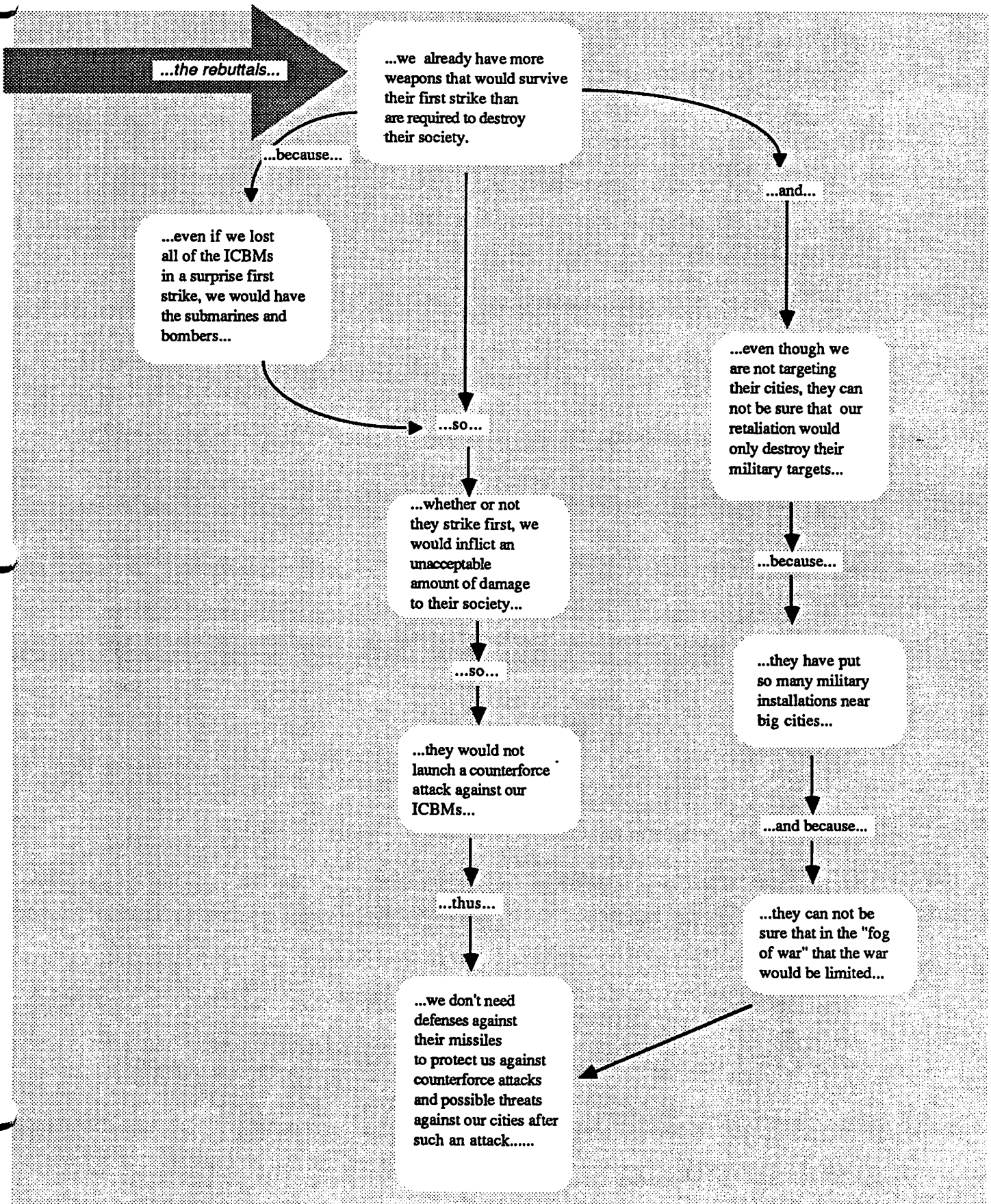
*It should be our policy...*

...to build a defensive system against missiles to protect our land-based ballistic missiles...

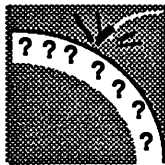


BUT, there are rebuttals...

... and the "sufficiency" and "uncertainty" rebuttals...







The proposed policy/strategy of...

# Increasing the attacker's uncertainty thereby improving deterrence

Because...

...the greatest fear we have is  
that they don't (or won't)  
believe our deterrent  
capabilities...

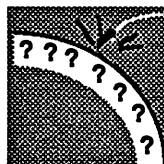
an even partially  
successful defense  
would complicate their  
planning so greatly...

...that no rational  
planners could be  
confident in hitting  
the targets they want  
to hit (presumably  
our most accurate  
land-based missiles)...

...so...

It should be our policy...

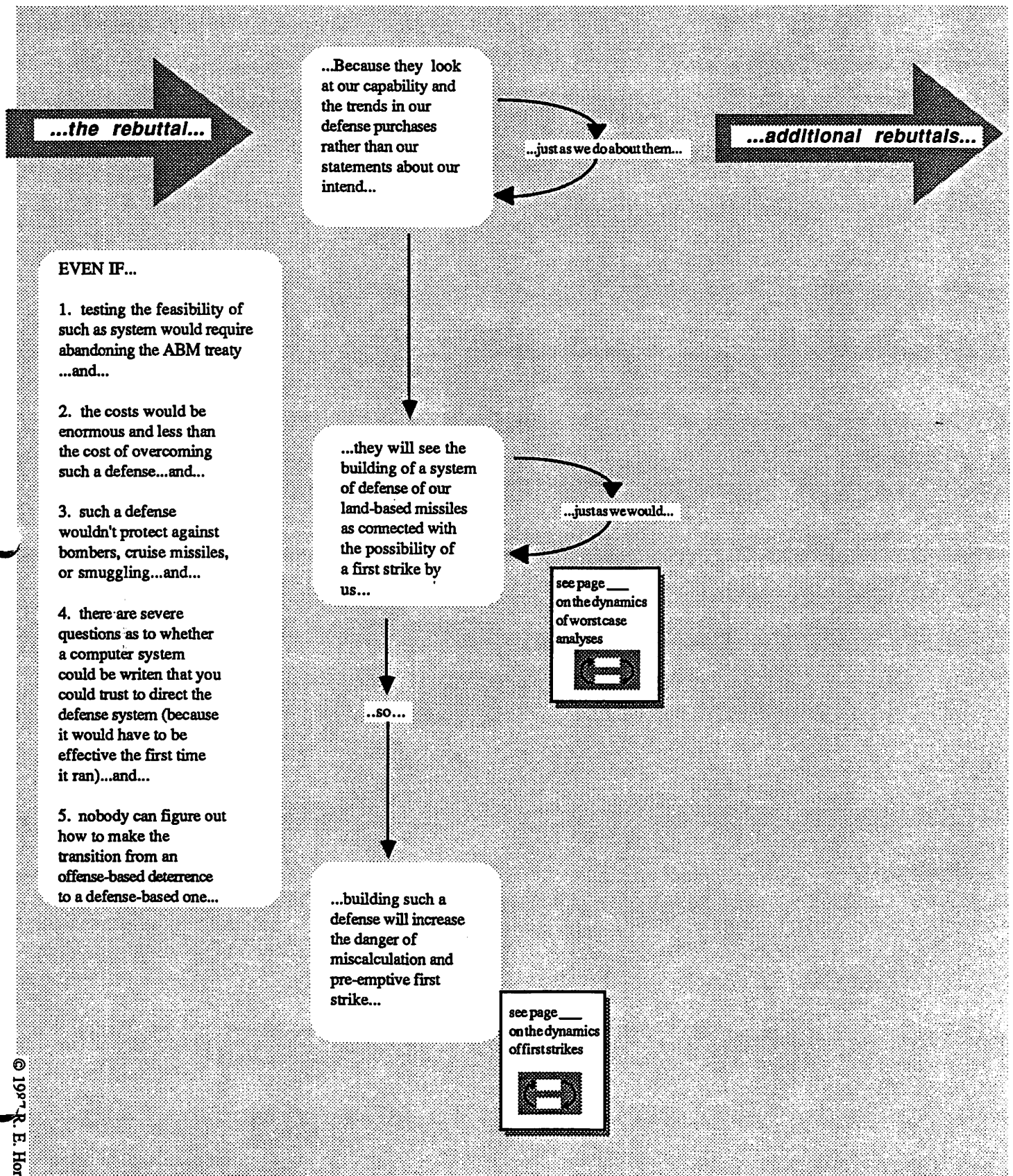
...to build a defensive  
system against  
missiles to improve  
deterrence by increasing  
the uncertainty of  
success of the attacker



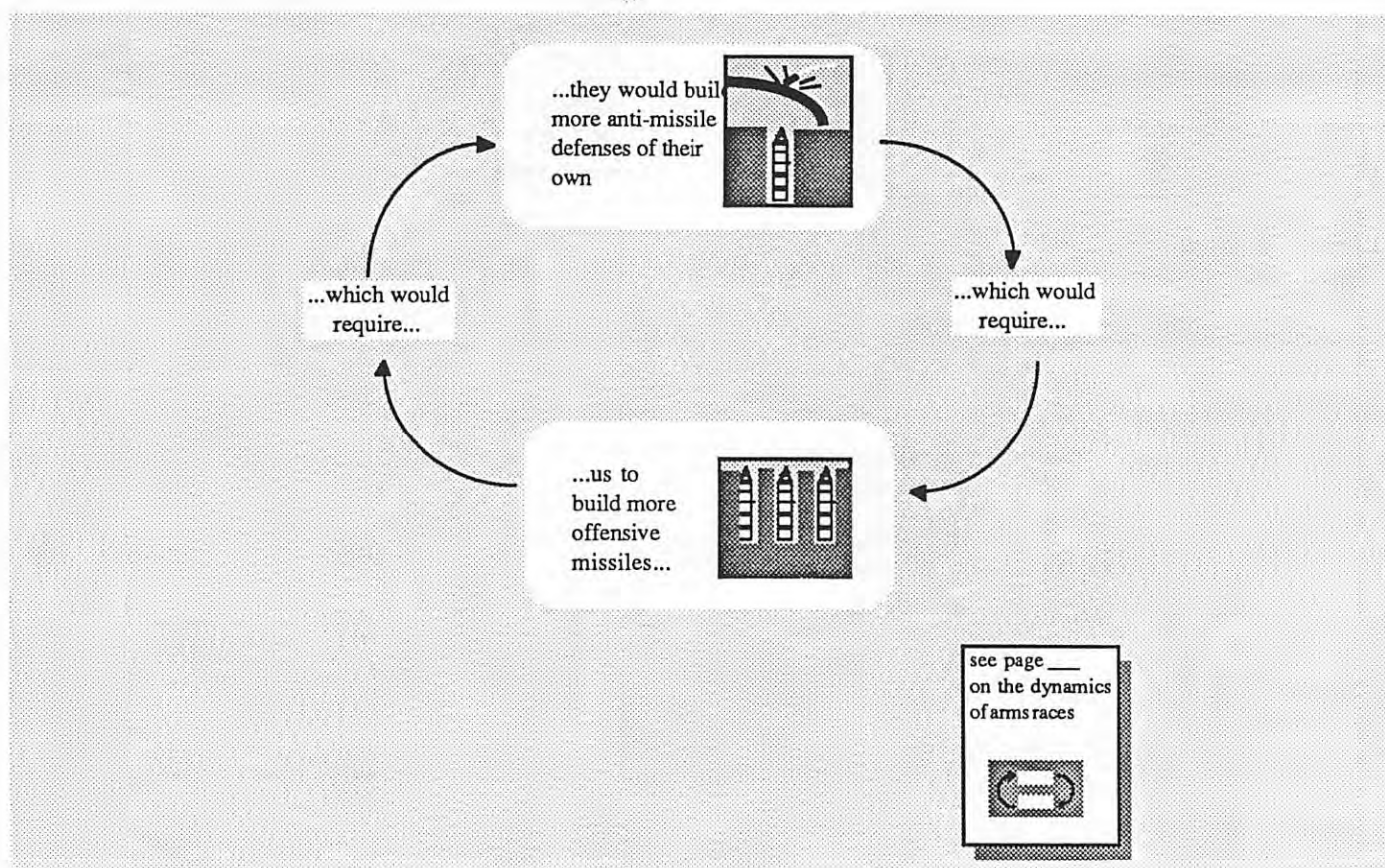
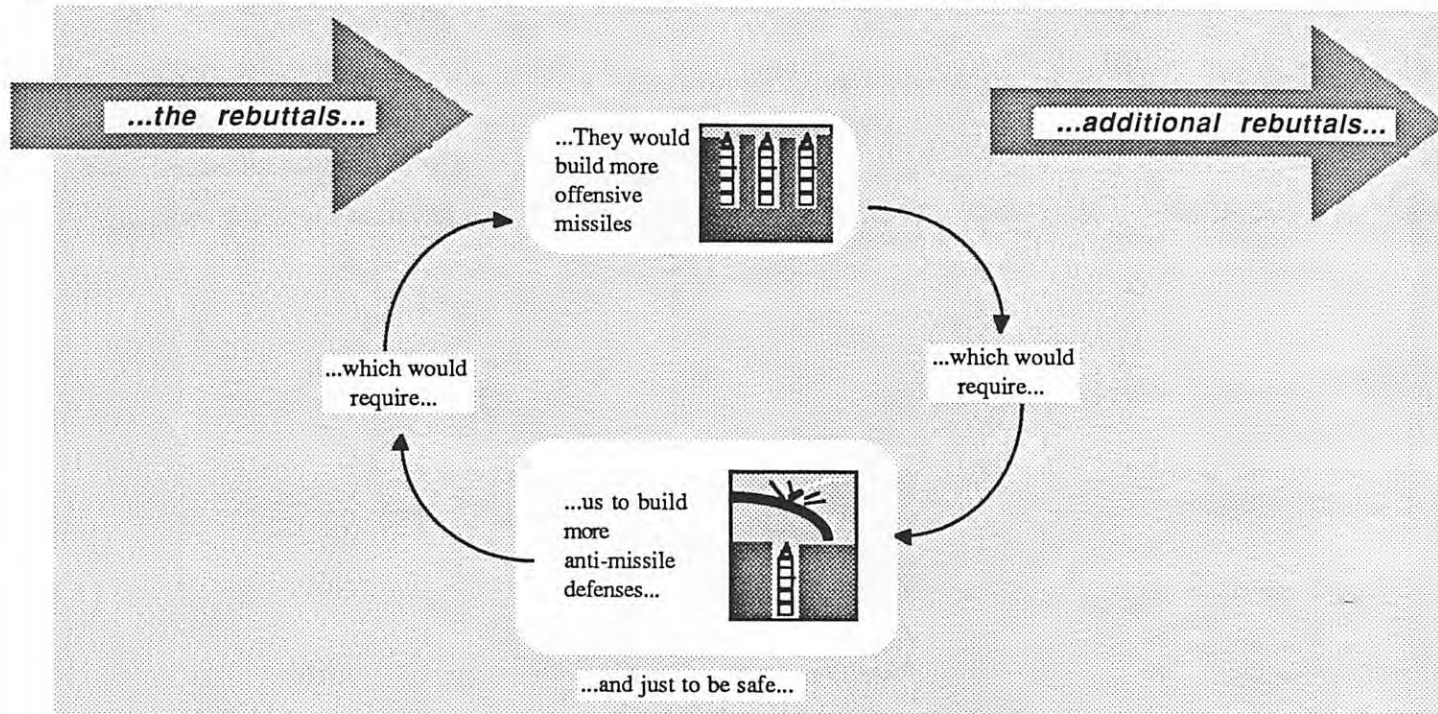
BUT, there is a rebuttal...



... and the increased danger of first strike rebuttal..

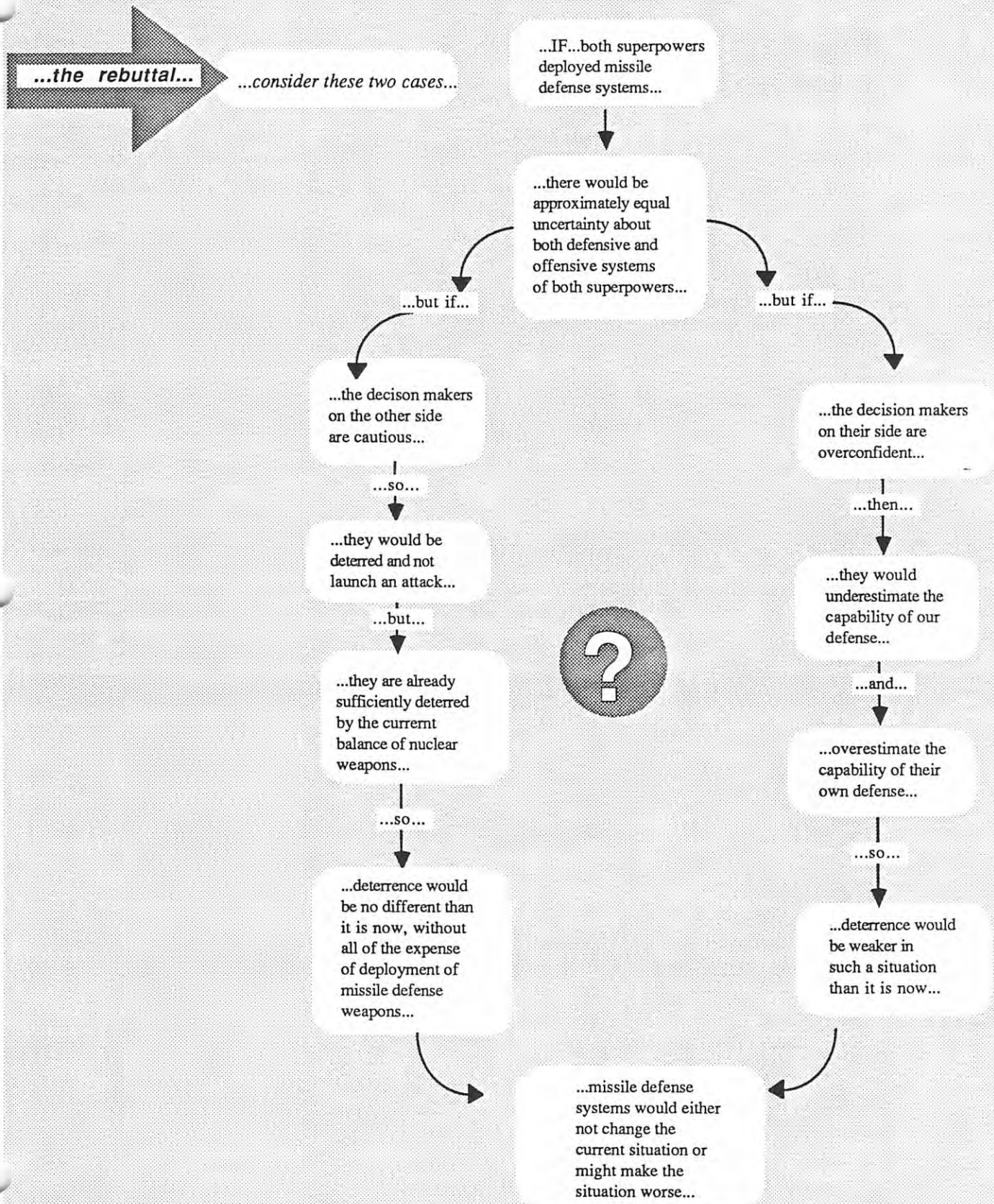


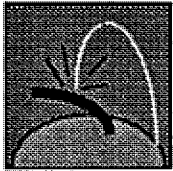
... and the "increasing the arms race" rebuttal...





... and the "uncertainty about uncertainty" rebuttals...





The proposed policy/strategy of...

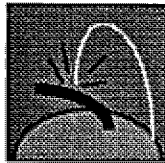
# Protecting against missile attacks by 3d countries or terrorists

Because...

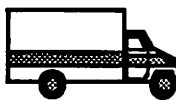
...the greatest fear we have is that some 3d country or a terrorist group will obtain nuclear weapons...

It should be our policy...

...to build a thin missile defense of our population and cities



...the rebuttal...



...3d countries are more likely to smuggle in weapons in to this country via truck or ship or in a suitcase...



...because...

...accurate delivery systems are much more difficult to build than are nuclear weapons...

...so...

...a much less expensive way to protect against such attacks is to stop the spread of nuclear weapons and technology to smaller nations (following the non-proliferation treaty)





The proposed policy/strategy of...

# Keeping our deterrent triad more invulnerable to improvements in their attack

...ICBMs are one of the triad of our deterrence forces...



...and...

...having two deterrent forces that are invulnerable to first strike attack (ICBMs and submarines)...

...is better than...

...having only one such invulnerable force...

...because...

...it makes our second strike deterrence force more believable...

...so...

It should be our policy...

...to build a missile defense to protect our ICBMs



...the rebuttal...

... we do not need ballistic missile defenses...

...BUTrebuttal...

see page rebuttal that USSR may not find this deterrence credible

...so...

...they could never be sure they could destroy all of our forces...

...and...

...there would likely be time to develop countermeasures...

...they developed weapons to threaten our submarines...

...and if...

...the expense of the extra "insurance" for deterrence does not seem to be worth it...

...so...

...we are considering absolute destruction of their society and military...

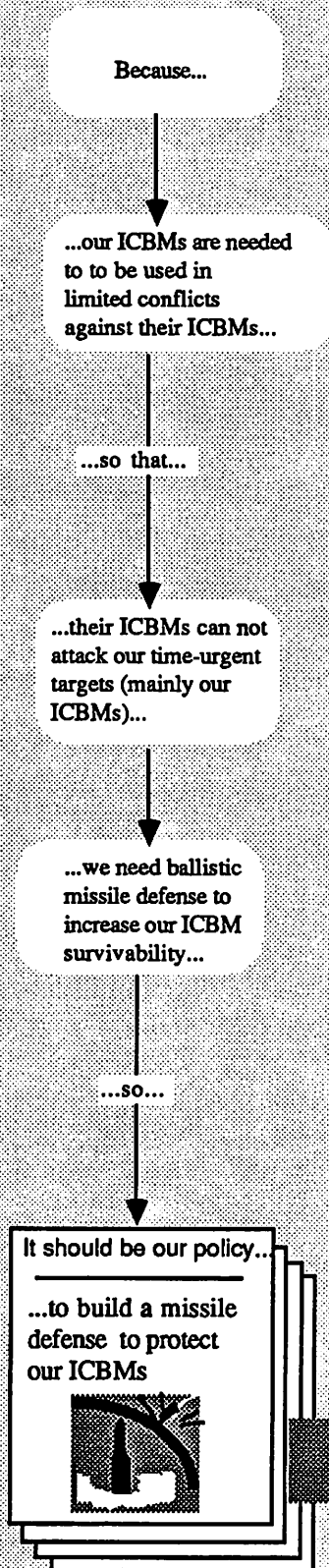


...when...

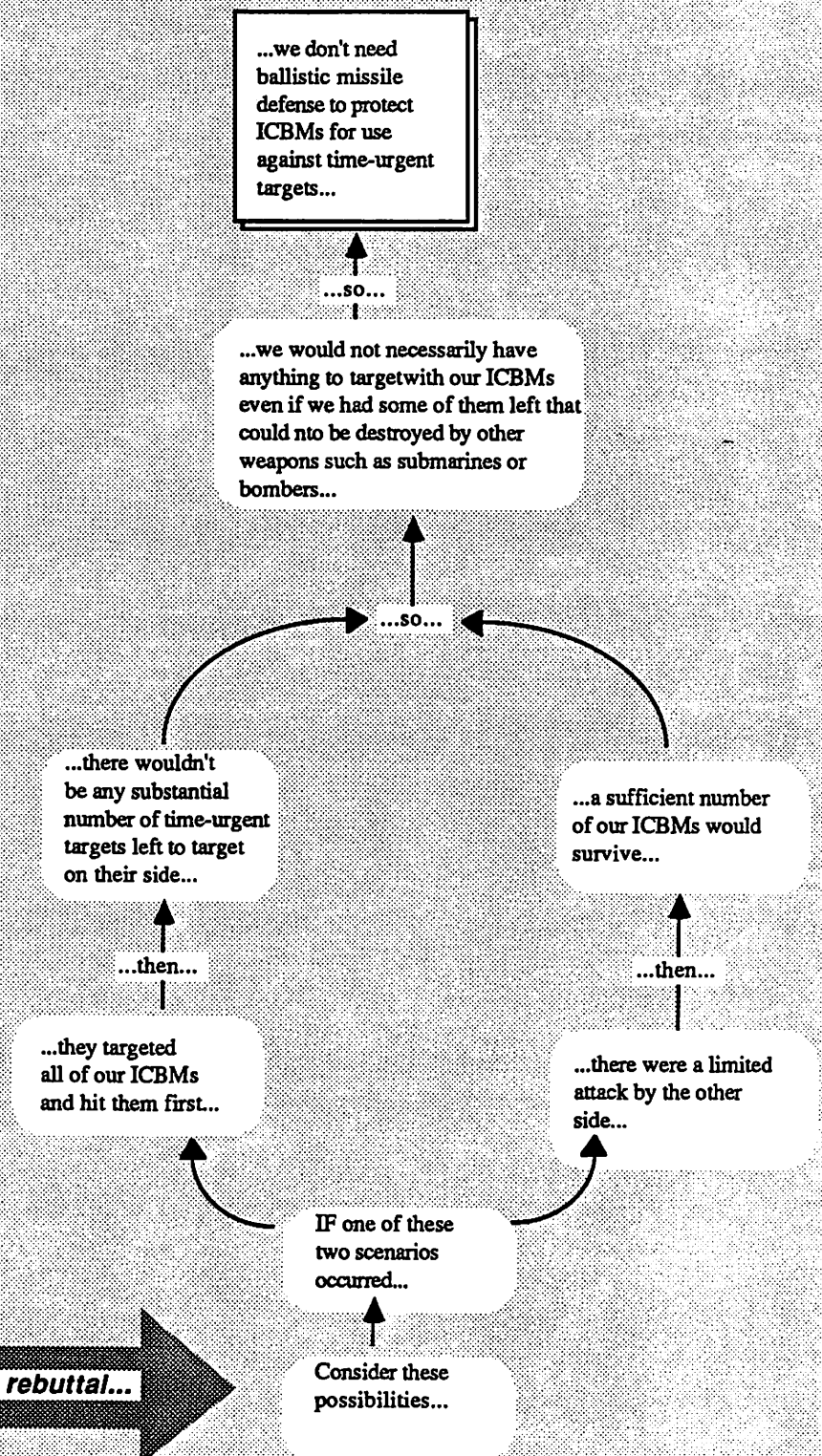
...one invulnerable retaliatory force (the submarines) is enough...



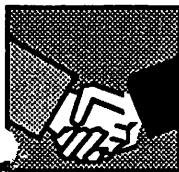
# Protecting our ICBMs for prompt retaliation against their time-urgent targets



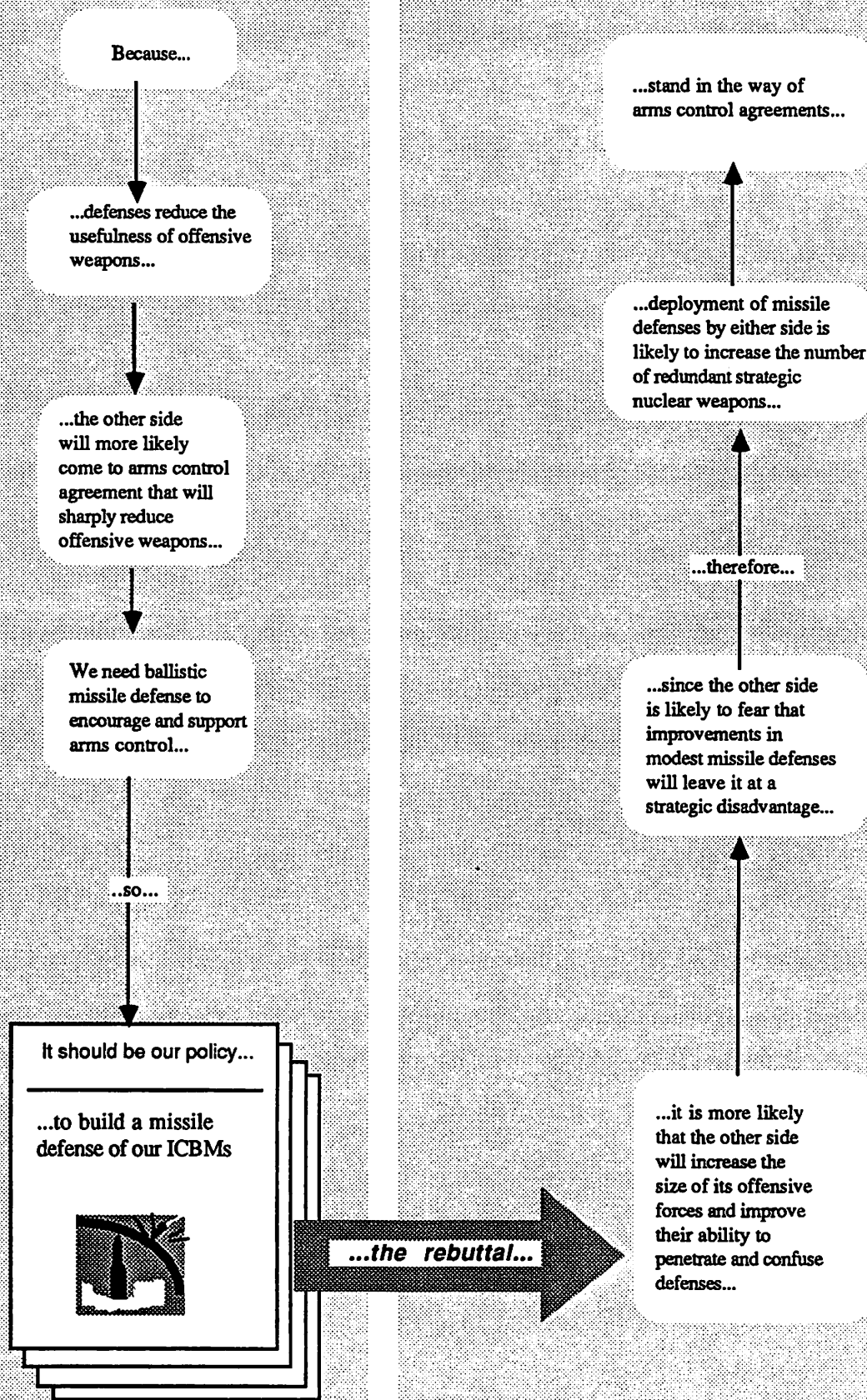
...the rebuttal...

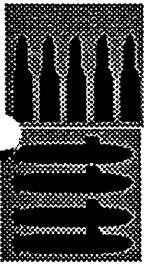






# Supporting arms control negotiations on nuclear weapons

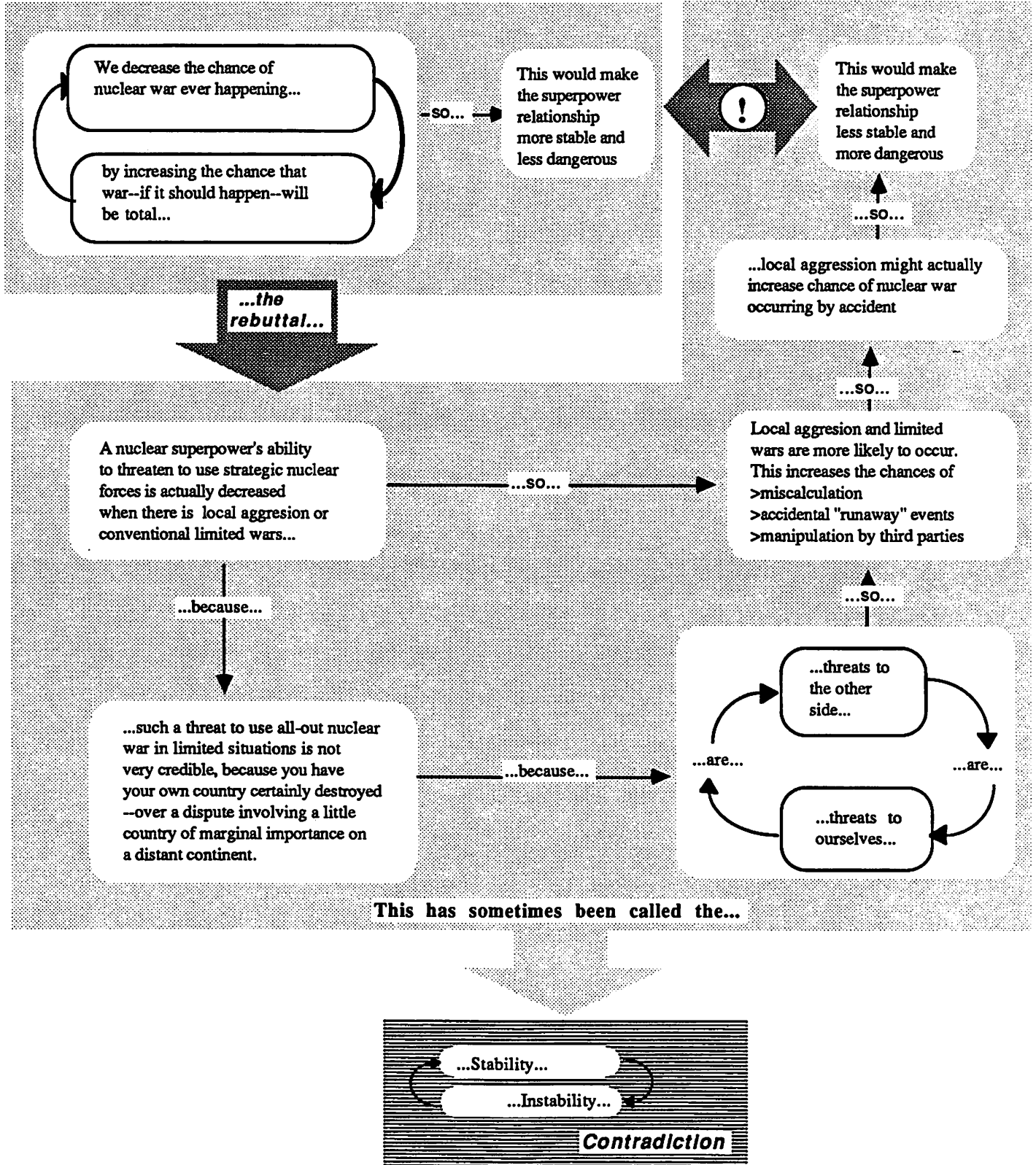




The proposed policy/strategy of...

# Building more weapons thereby making war so total that no country would ever initiate it

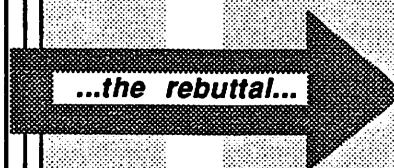
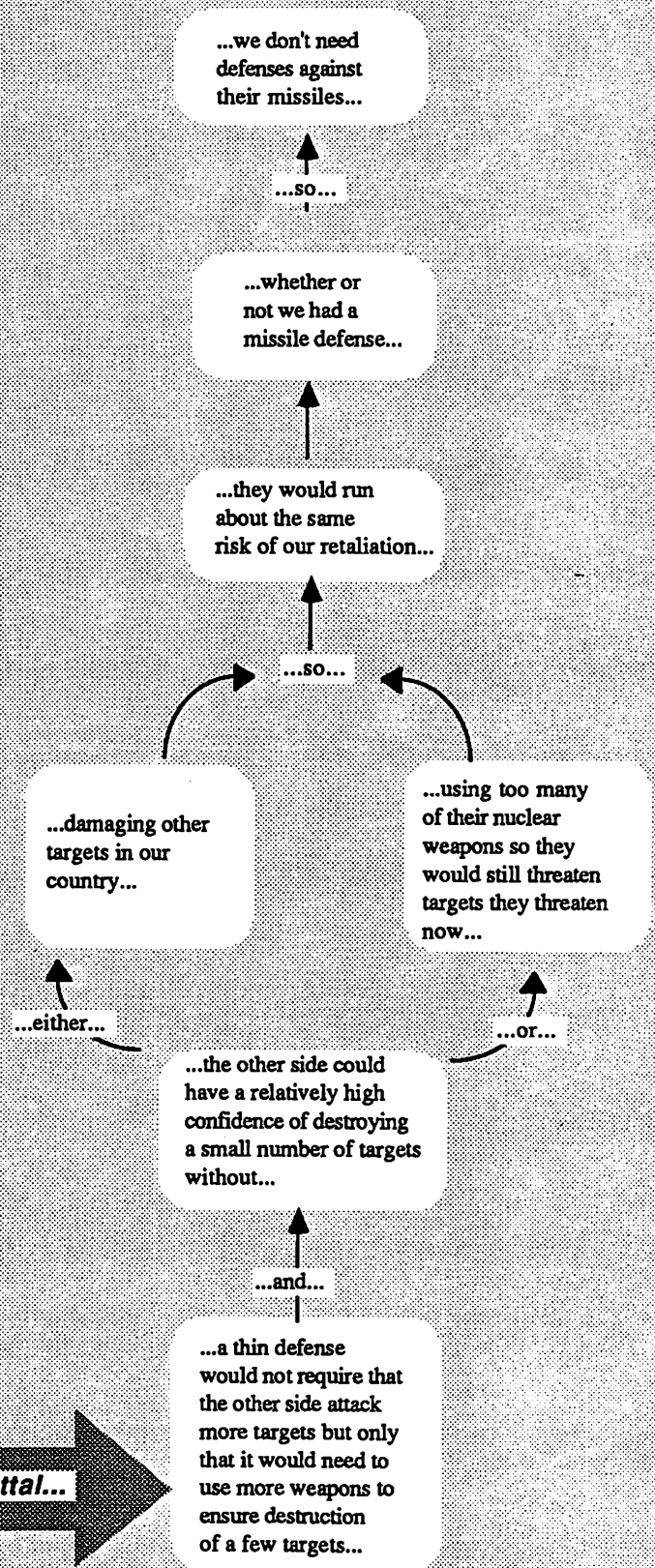
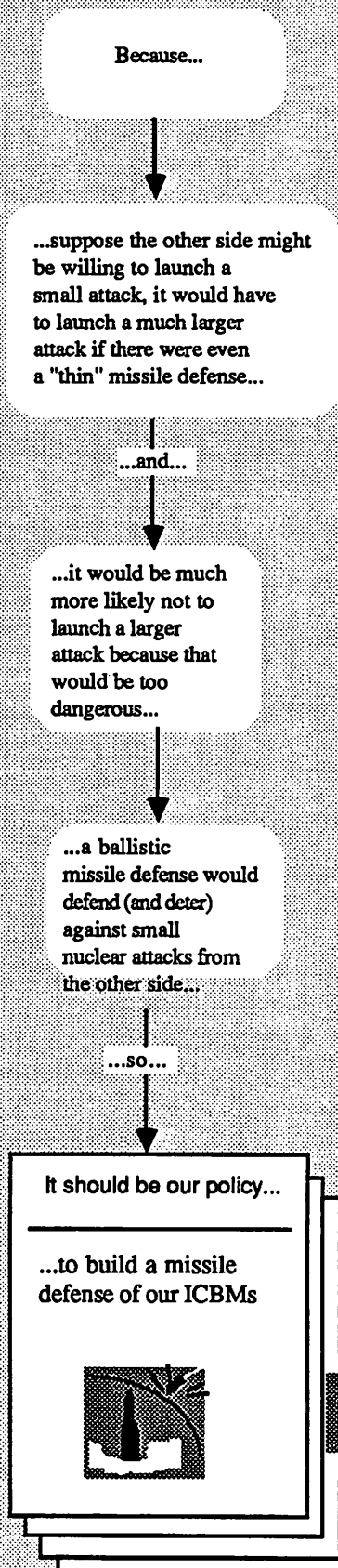
Some argue that we should make certain nuclear war would be so horrible and total that no one could conceive of it happening. This, they argue, would decrease the chance of it ever happening.







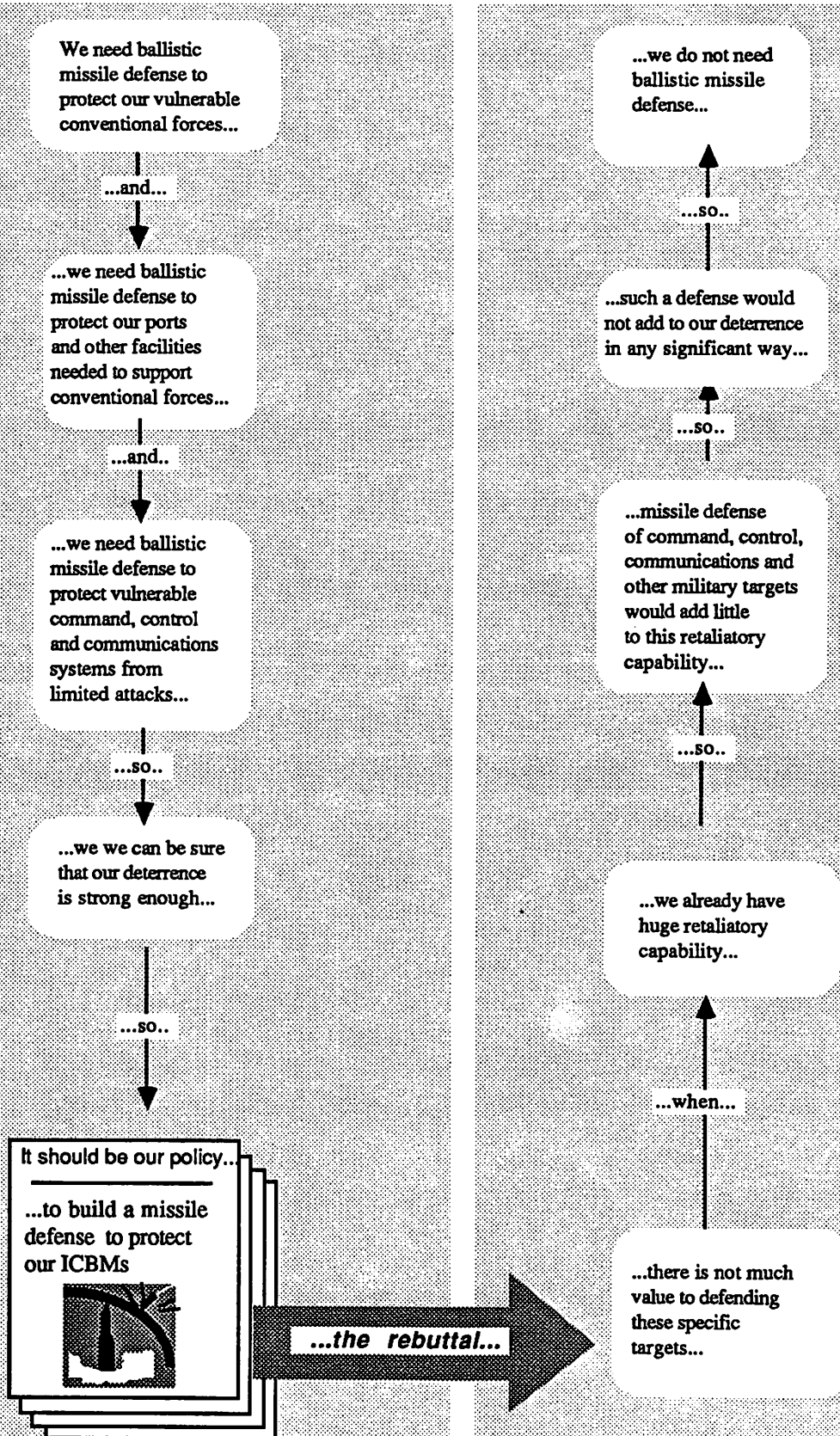
# Detering against relatively small and limited nuclear attacks





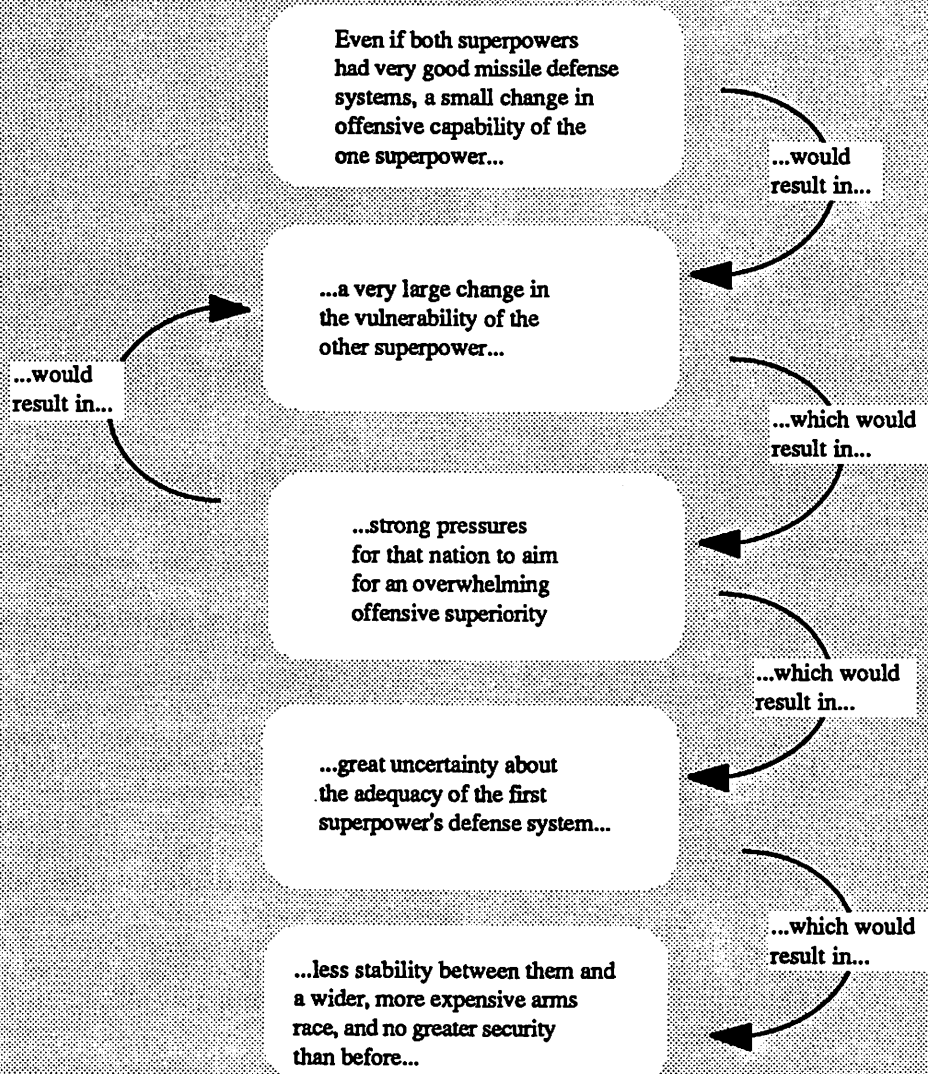
The proposed policy/strategy of...

# Strengthening deterrence by protecting conventional military targets

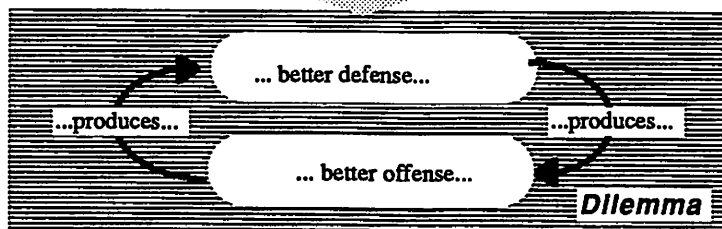


# The Worst Case Analysis of a Good Missile Defense System

A good defense sounds ideal, even if it weren't perfect.  
But it would carry with it problems that might make it  
even worse than we have now.



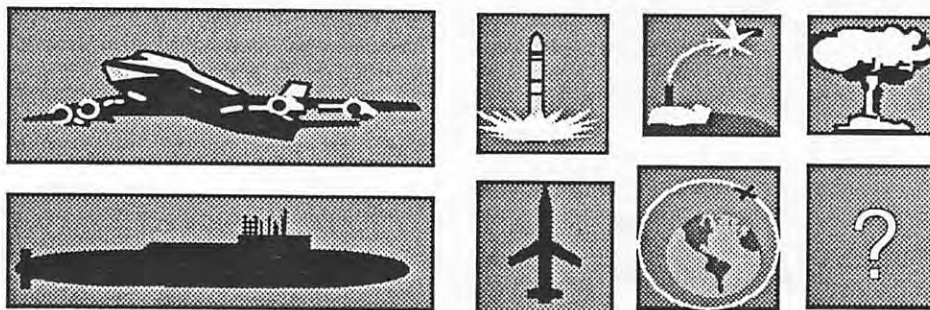
You ask "How do we produce a better offense for the other side?" The answer is, "Start deploying a better defense on this side."  
This has sometimes been called the...





## Chapter 6. Dangers in Crisis

The deployment of new very accurate weapons has deepened the problems of maintaining credibility of deterrence in crisis. This chapter examines the dynamics of credibility in crisis...



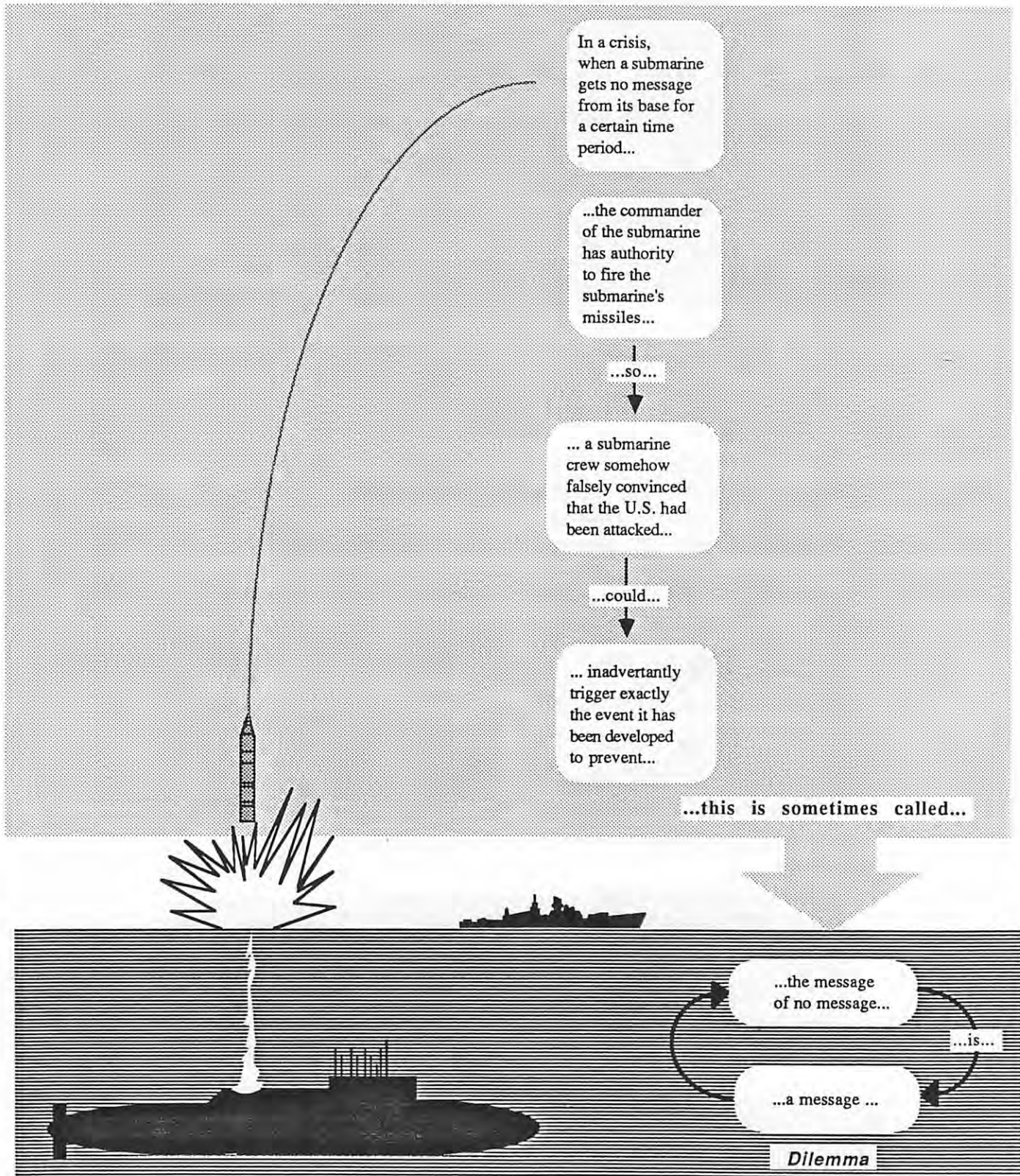
Then we present a worst case scenario of nuclear attack...



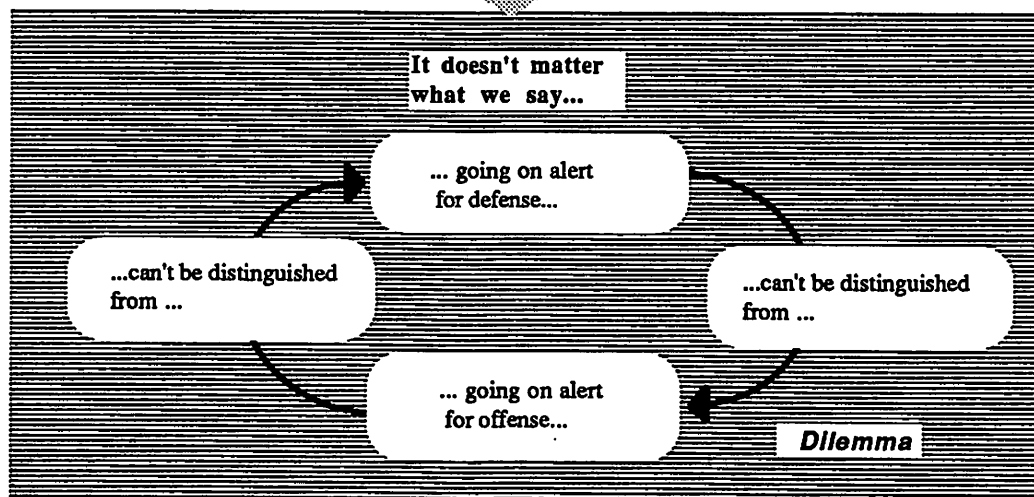
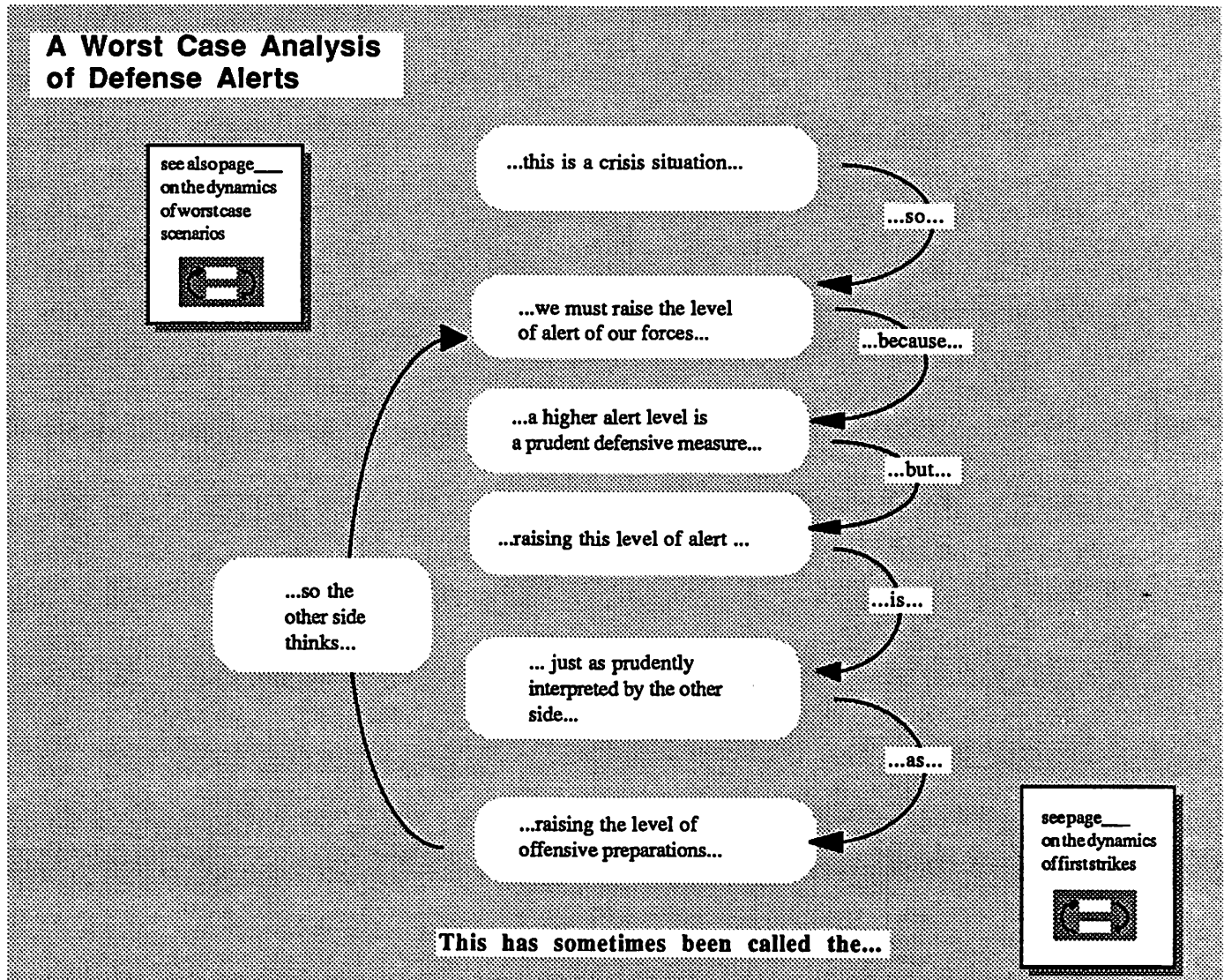


# What are U.S. submarines programmed to do in a crisis?

U.S. missile-launching submarines are known as the "revenge" patrol, because they are invulnerable to Soviet attack and hence could fire their missiles long after the U.S. was destroyed in an attack. Submarines get communications from frequent shore-based stations. What happens when these shore-based communications stop? The submarines check their equipment and try to communicate with other locations through other channels. If no communication occurs, what are they to assume?

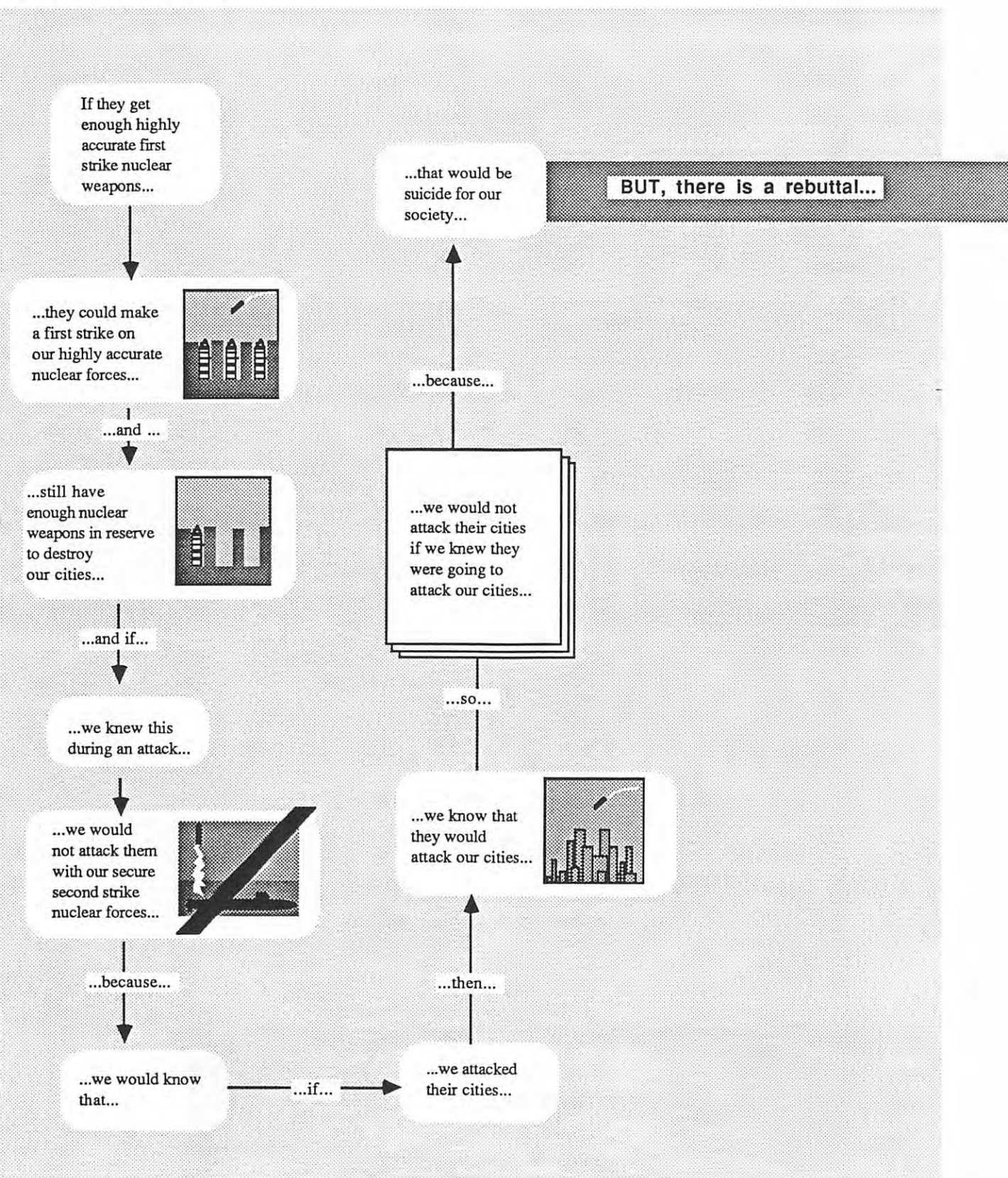


# The problem of raising alert levels...

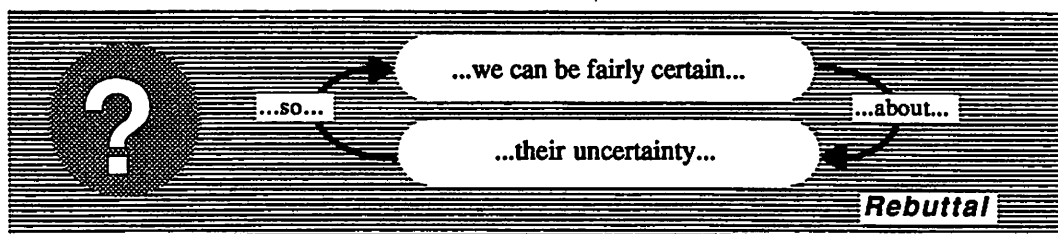
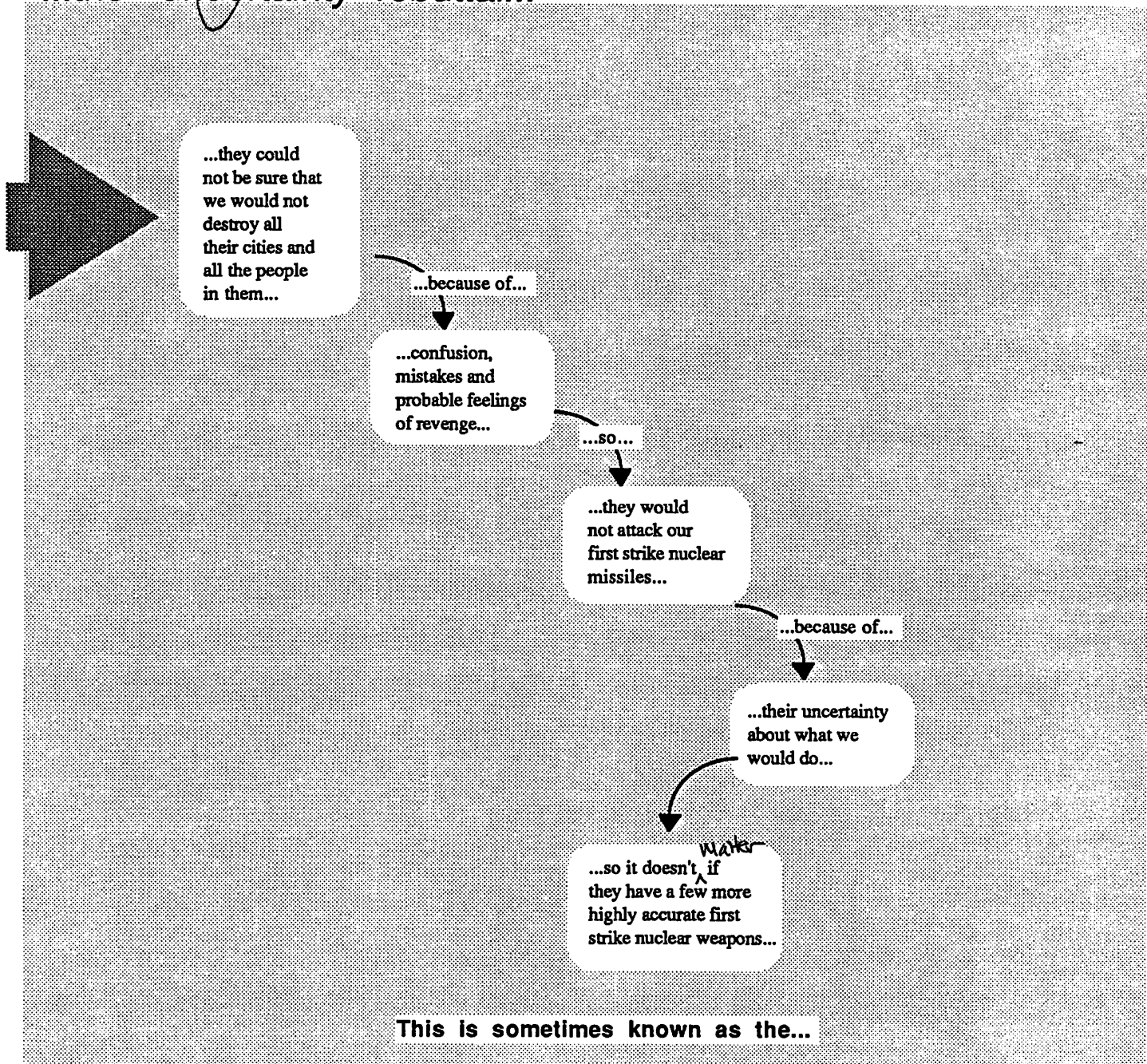




# The advantage of very accurate, first strike weapons creates the window of vulnerability dilemma...

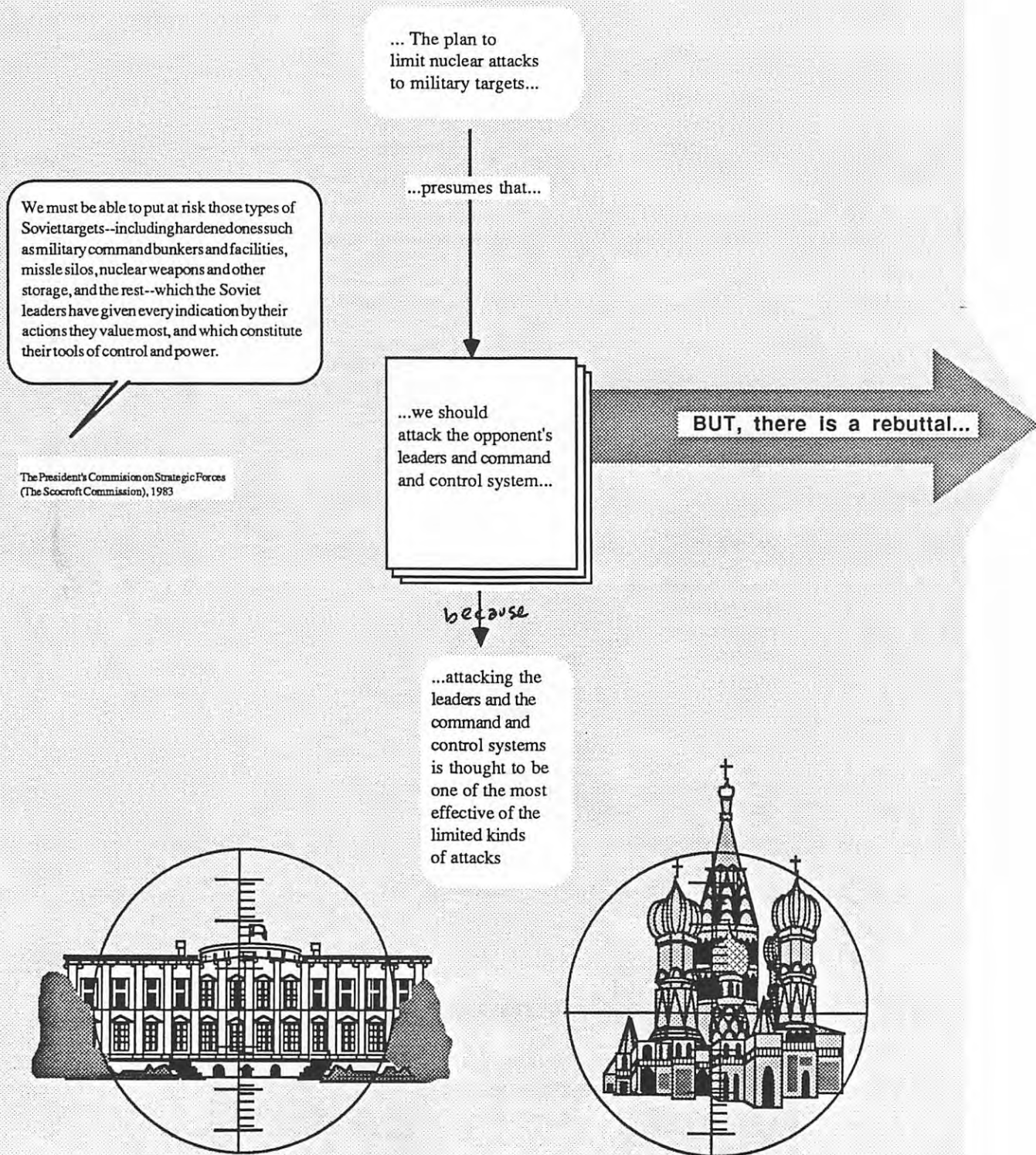


...the "undertainty" rebuttal...

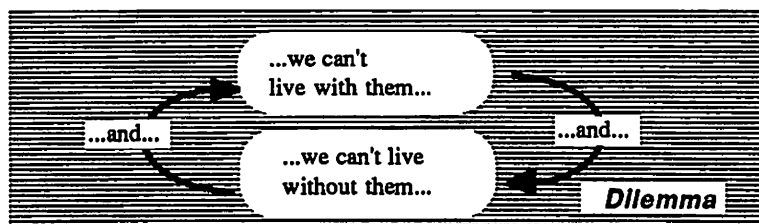
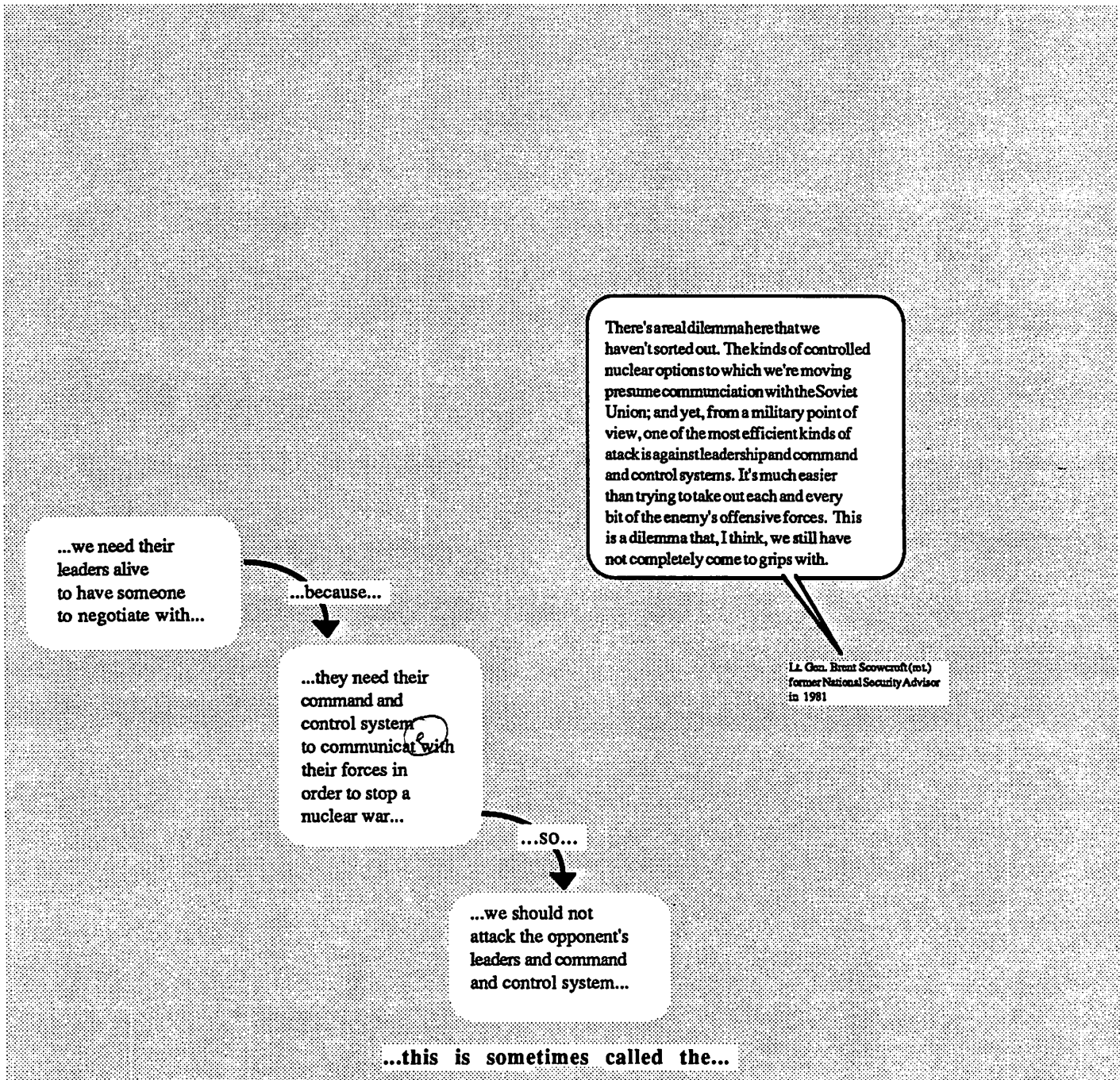




# We should target the other side's leaders in a nuclear war...



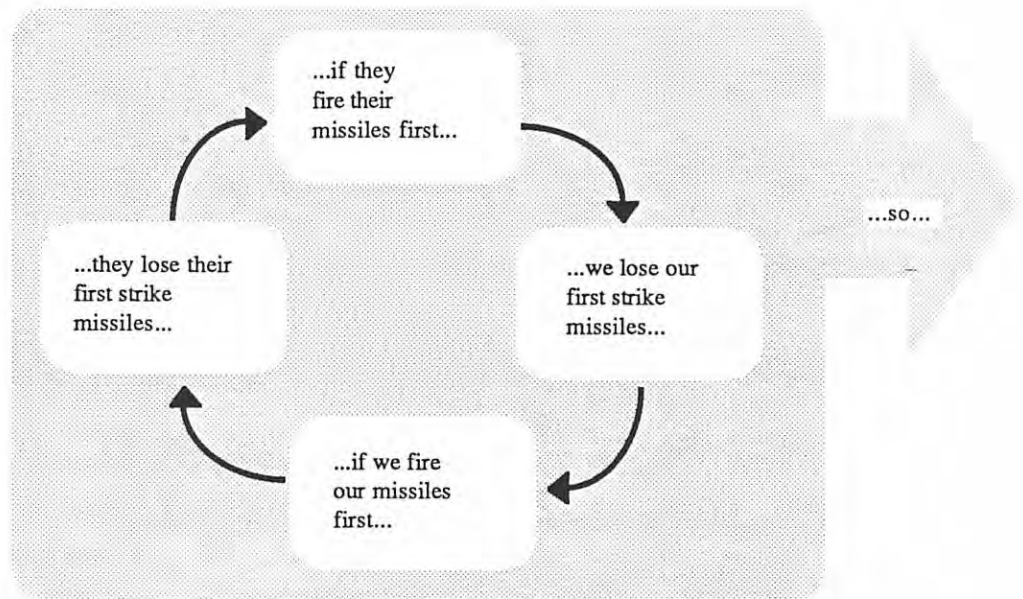
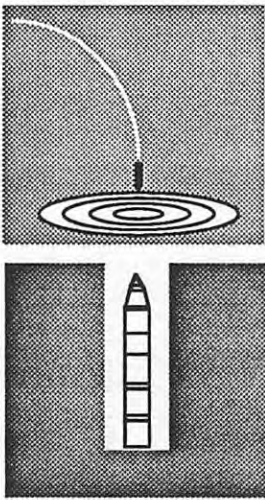
...the "we need them to negotiate" rebuttal...



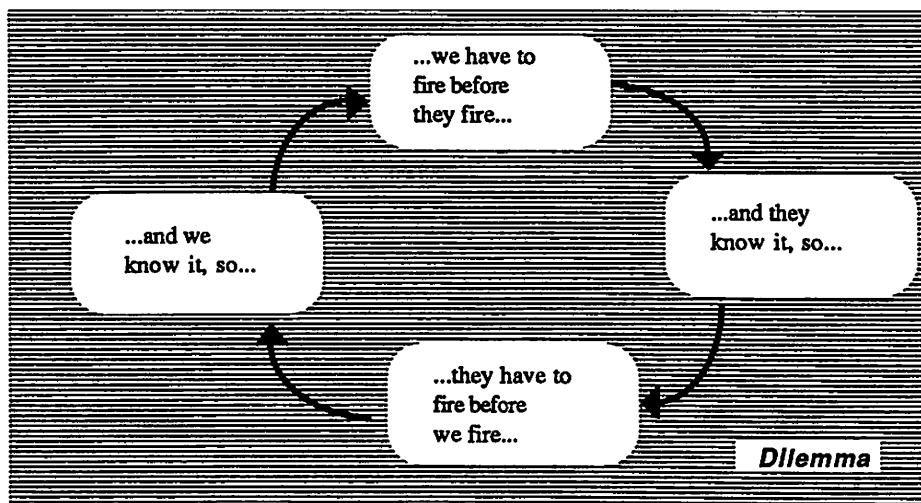
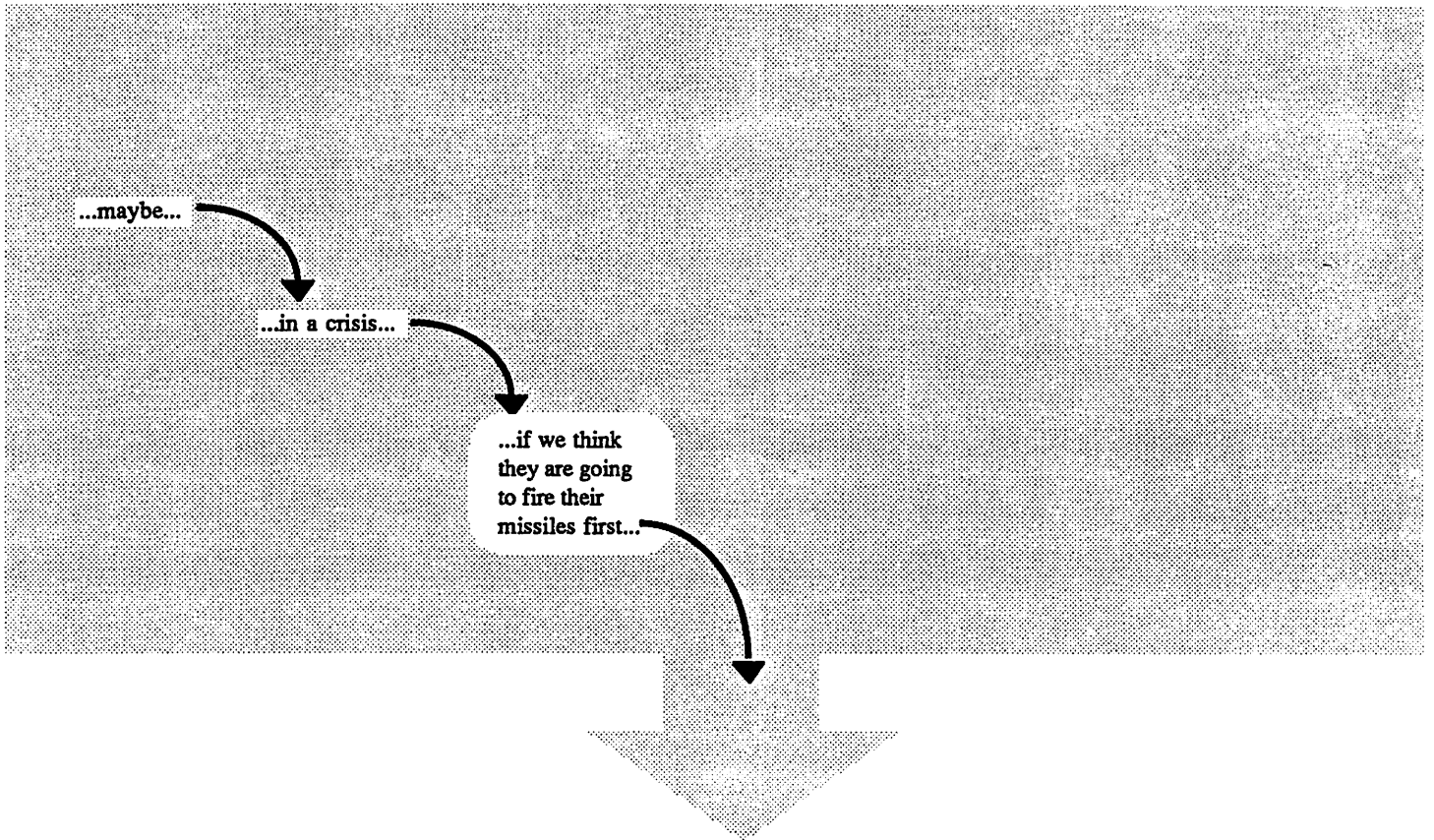
# The "who attacks first" dilemma

It is taken as an axiom of nuclear targeting policy that...

1. The first targets of any first strike would be the very accurate, large, land-based missiles of the other side, because they can do the most damage of the important military targets of the other side.
2. It is also taken as an axiom (by some, though rebutted by others) that whoever strikes first has some advantage in limiting damage. Those that disagree say that after the retaliatory attacks it won't make a difference to either society.









## *Accuracy*

I believe there is some misunderstanding about the degree of reliability and accuracy of missiles....It is impossible for either side to acquire the degree of accuracy that would give them a high confidence first strike, because we will not know what the actual accuracy would be like in a real world context....The point I would like to make is that if you have any degradation in operational accuracy, American counter-force capability goes to the dogs very quickly. We know that, and the Soviets should know it, and that is one of the reasons that I can publicly state that neither side can acquire a high confidence first strike capability. I want the President of the United States to know that for all the future years, and I want the Soviet leadership to know that for all the future years.

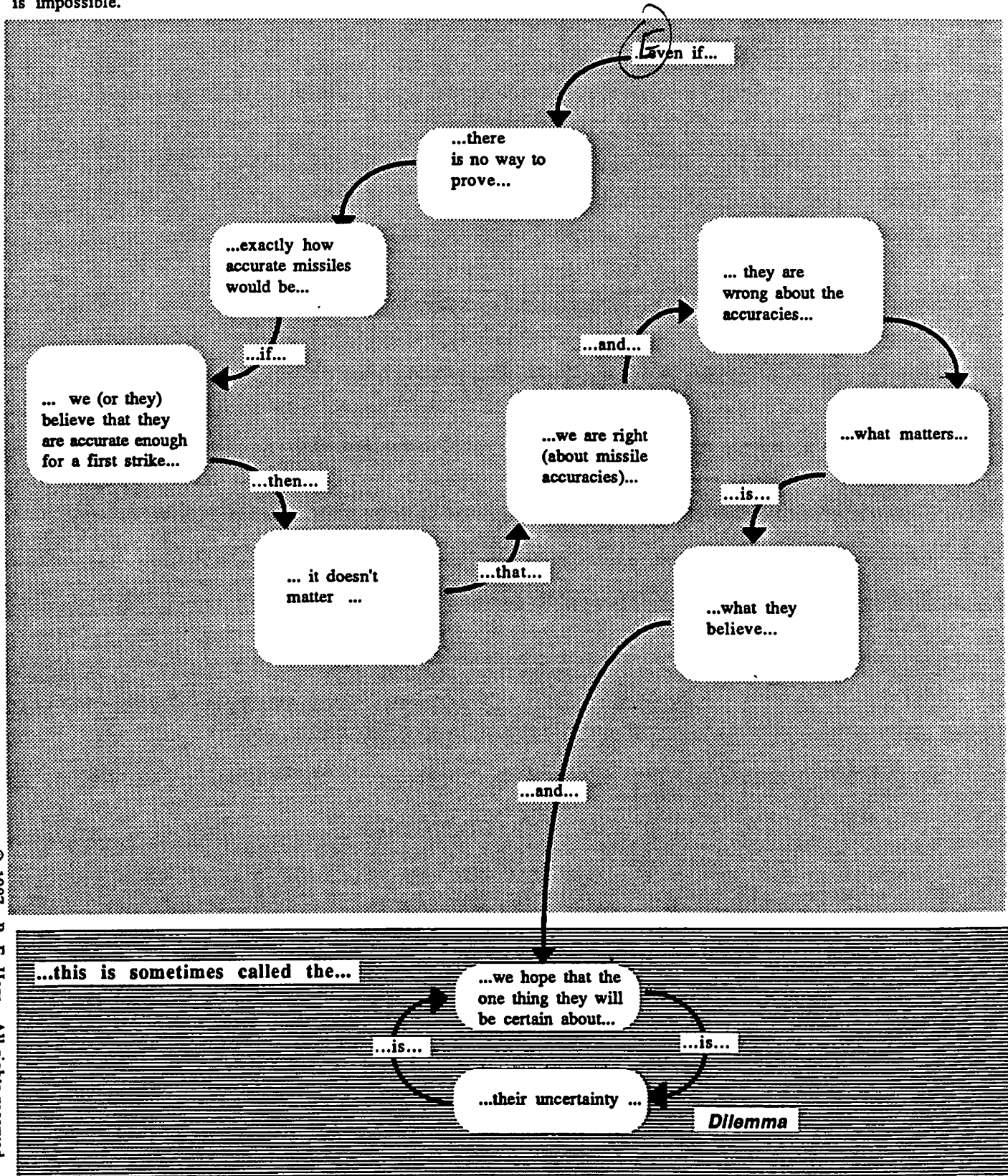
James Schlesinger  
former U.S. Secretary of Defense  
in testimony to the  
Arms Control Subcommittee of the  
Senate Foreign Relations Committee  
March 4, 1974

There are a lot of unknowns here. Some people say we're going to hit the target with the first round. Others say forget it. The point is that it doesn't make any difference. If the people who are in charge, the leadership of the United States and the Soviet Union, believe that they have these accuracies, then they behave as though they have them. It doesn't make any difference whether they're right. It's what they believe that counts.

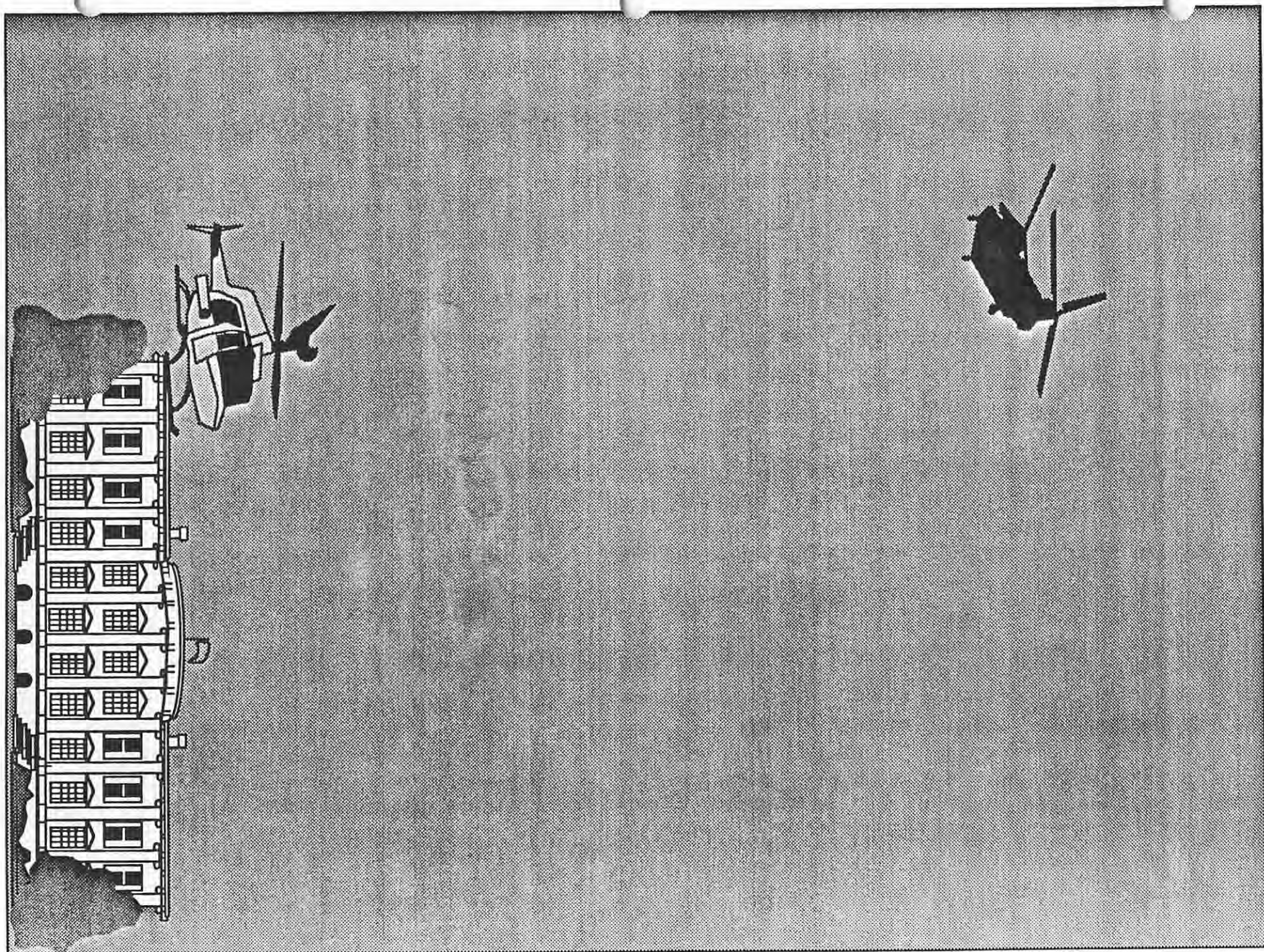
Col. John M. Collins  
Defense Specialist  
Congressional Research Service  
Author of U.S.-Soviet Military Balance

# What difference do missile accuracies make in planning?

Some say that we can know exactly how accurate the intercontinental missiles are. They say that the missiles can fly 10,000 miles or more and land within 200 yards of their targets. And they claim that a decision maker can rely on these measurements. Others say this kind of accuracy is impossible.

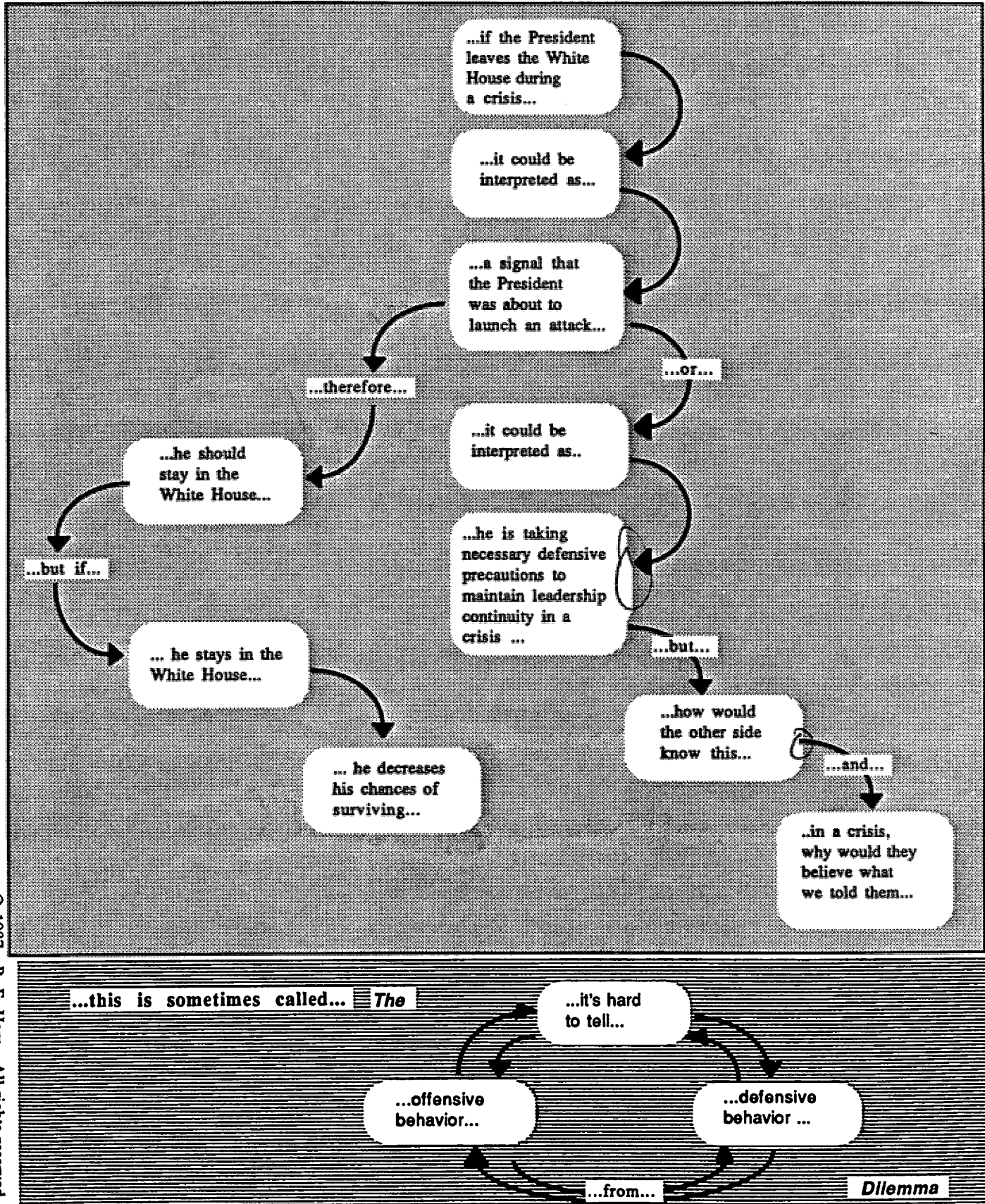








# Why would it be difficult for even the President of the United States save himself during a crisis?



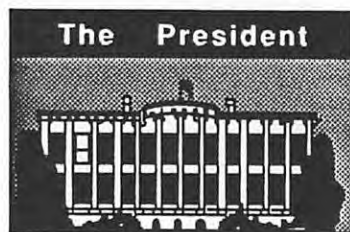


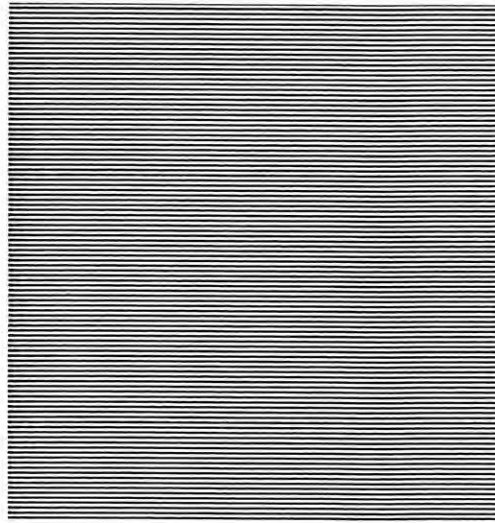
## What Would a Crisis Look Like?

In the last half of this chapter we present an investigation of the vital aspect of timing in a crisis. In it we look at a scenario that covers 17 minutes from the time a hypothetical missile is launched from a Soviet submarine is detected, to the President's decision on how to respond.

We also look at this process from the standpoint of the potential for error that such a tightly coupled system generates.

We gaze directly upon the awesome decisions we hope no President and no General Secretary will have to face.





## This Scenario



The scenario depicted in the following pages is only one of many that could be described. It has been selected to show some of the most important and dangerous aspects of the current deployment of nuclear weapons, so that decision makers and citizens can consider the national goals from a realistic perspective.

## International Situation



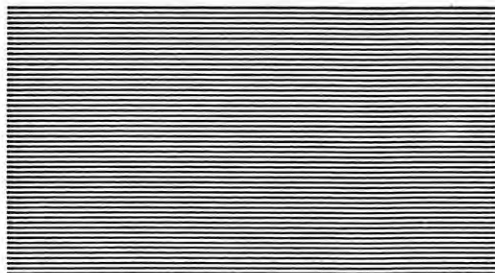
Any scenario must describe the international context in which the scenario takes place. In this scenario, the U.S. and U.S.S.R. are neither at a crisis level nor are they on the most friendly of terms. There has been a series of threats and counterthreats over the Middle East. The U.S. has warned again that its vital national interests are at stake in the Persian Gulf situation.

## Time

**1:00 A.M.**

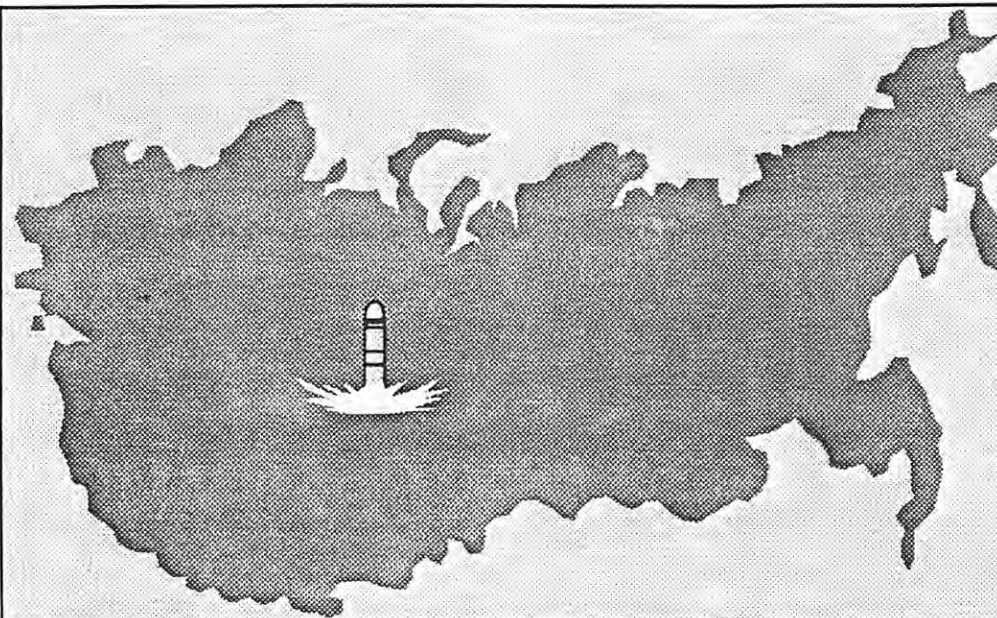
One minute of time is represented in this scenario by a single page. The scenario starts at 1:00 A.M. Eastern Standard Time.

If you read at about 200 to 300 words per minute (average reading speed), the time it takes you to read this scenario would be approximately the time it take to execute the actions and decisions described.



**1:00 A.M.**

## First U.S.S.R. Land Based Missile Launched



### **The Weapons and Numbers**

The Soviet Union has 1,028 intercontinental range missiles. Aboard these missiles are 9,300 nuclear warheads, each of them capable of far more destruction than the explosion at Hiroshima.

### **This Scenario**

This scenario contains the assumption that at least one of these might have been launched.

## First U.S.S.R. Submarine Missiles Launched

### **The Weapons and Numbers**

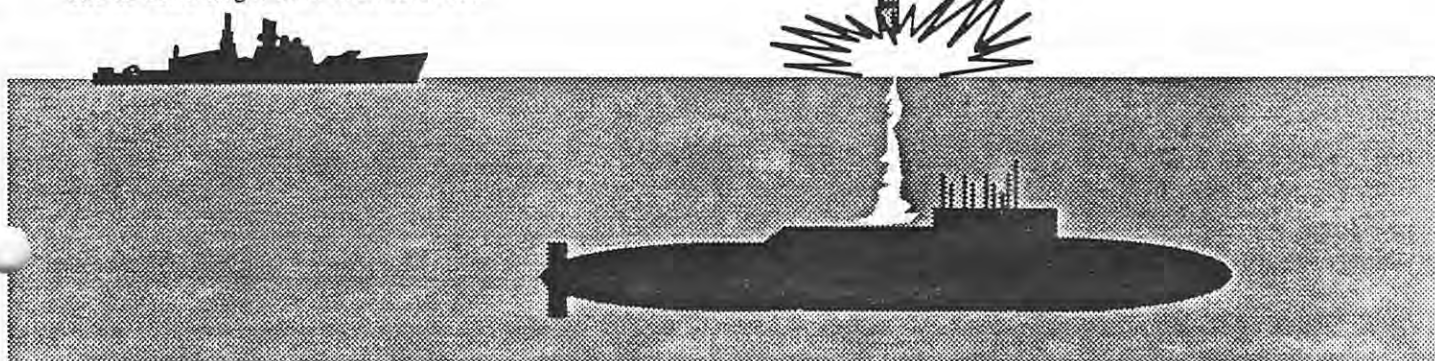
The Soviet Union has 65 missile-launching submarines. Their missiles, which can be launched from under the oceans, carry 978 missiles with an estimated 1,626 to 3,914 nuclear warheads.

### **Deployment**

The U.S.S.R. keeps 6 to 8 of these submarines on routine patrol in the Atlantic and Pacific Oceans. However, many of these submarines, which are docked at their bases, can launch their missiles and hit U.S. targets.

### **This Scenario**

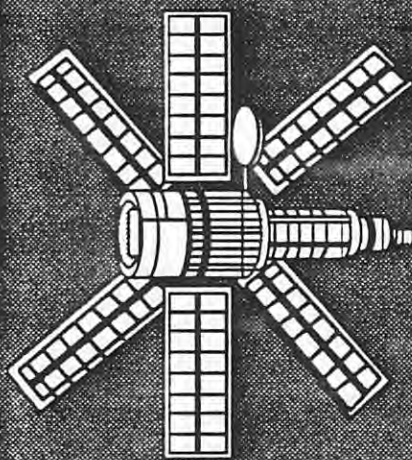
This scenario assumes that at least one of these might have been launched.





1:01 A.M.

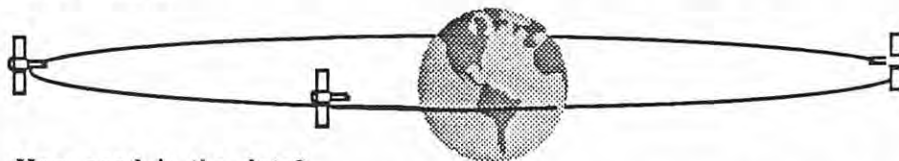
## U.S. early warning satellite spots nuclear weapons launches



**Designation**  
Code 647 Defense  
Support Program  
satellite  
(DSP East & West)  
**Length**  
20 ft  
**Weight**  
More than a ton.  
**Equipment**  
Schmidt infra-red  
telescope  
**Distance  
from Earth**  
36,000 kilometers

### How does the satellite detection system work?

The U.S. has three early warning satellites in continuous orbit around the earth. They are located in approximately stationary positions slightly above the equator from which they can monitor the Soviet Union, the Atlantic and Pacific Oceans for all missile launches. They detect infra-red emissions from the hot gasses of ICBM exhaust plumes. About thirty seconds after launch of a missile, these satellites pick up the emissions as the missile emerges from the lower atmosphere. The data is reported to ground stations which convey them to computers which synthesize it. That data is then displayed to human operators who analyze and evaluate it.



### How good is the data?

These satellites can tell if a missile has been fired. They cannot tell how many have been launched beyond a certain number. They cannot tell from which missile field the missile has been fired. (Implication: it would not be possible to know which of the many widely dispersed Soviet missile fields were empty and which still contained missiles). One government official said: "They're really not all that sophisticated. They basically just give you an early indication that something is probably happening."

### Type of errors reported

In December 1975 these satellites picked up heat from a gigantic fire in Siberia when part of a natural gas field exploded.



1:02 A.M.

# First ground notice of satellite detection of missile launch

## Description and Location

Deep inside Cheyenne Mountain in Colorado is the North American Defense Command Center (NORAD). It is the nerve center of U.S. defense in a missile attack. Initial information about missile launches are immediately registered on displays here. This is where the data collected by the infra-red satellite would come to be evaluated.

## Survivability

It is buried under 1,500 feet of granite and can operate without outside help, supplies, or power for up to 30 days. It is, nevertheless, regarded as a "soft" target because it was built near the top of the mountain rather than under the mountain. With superaccurate Soviet ICBMs, it is unlikely that the NORAD command center would survive longer than 30 minutes if it were targeted during an attack.

## Vulnerability

As of 1982 it did not have a reliable emergency power supply. Power surges and power outages shut down its computers.

Alert

## What is a Missile Display Conference?

A Missile Display Conference is a formal state in the alert process that is convened among the top duty officers at NORAD, SAC (the Strategic Air Command) and NMCC (the National Military Command Center at the Pentagon). Its purpose is to assess whether incoming data from satellites and radar constitute a probability of attack.

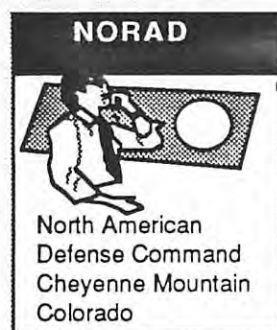
## How often is there an alert?

Usually confidential information. But a Congressional inquiry revealed that during an 18 month period to the end of June 1980, there were 3,703 lesser alarms and about 2 or 3 major alarms per year.

Sir, we have a launch detect from geostationary satellite. Location is over the Mid-Atlantic. I am initiating a Missile Display Conference.

1:03 A.M.

## Is it an error? Is it an equipment malfunction?



This is our assessment. We have only one indication of attack, NORAD. Infra-red satellite reading of launch emission in mid-Atlantic. The international situation is relatively calm. We have no reason to think this is an attack. I have to place this at less than 50% confidence of an attack. Our assessment is attack positive. Confidence: 40%.



This is SAC. We have a similar reading on our screens, sir. I have scrambled our crews to their B-52's and start their engines. I believe we must move to next level of alert. We have to act as if it were a 50% level.



Procedures call for moving to the next alert level unless we can specifically discount this data. I concur we go to next level. And we do the usual verifications.

### Description and Participants

The Missile Display Conference takes place on the phone among the duty officers at key defense locations, a few seconds after the first possible identification of a missile.

### Situation Appraisal

The NORAD staff and the Missile Display Conference must determine if all systems are operating properly. They must ask:

- Are other satellites and radars reporting any supporting information?
- Are there any malfunctions in the computer equipment that receives and processes the data from radars and satellites?
- Are the radar stations around the world operating as expected?
- Are the communication links working and secure?

- Is there any evidence of sabotage? of radar jamming?
- What are the human operators seeing and what is the proper way to interpret the data?

### How Good Is the Data?

The early warning radars were not designed to provide a precise attack assessment. They are "tripwires to alert the military to defend itself." They are, reportedly, unable to provide a very accurate count of the size of the attack, i.e. the number of incoming missiles and warheads. The radars in addition are thought to be relatively easy to jam. Communications links between NORAD and the satellite stations on earth are easy to sabotage. Many of NORAD's computers are old and slow. All of this is, obviously, known to the staff at NORAD and taken into account in an attack assessment.

### Type of Errors Reported

On June 3, 1980, a component in one NORAD computer malfunctioned and sent emergency messages to SAC that two Soviet submarine-launched missiles had been fired at the U.S. This triggered an alert described in the following pages of this scenario. An investigation revealed that this false alert was due to a 46 cent computer chip manufactured in Taiwan. The chip was part of a communications multiplexer. The alert was stopped by a Missile Display Conference about 4 minutes after the false reading on radar screens was first noticed.



1:04 A.M.

## Preliminary alert ordered

### Description.

A preliminary alert puts American forces on notice that something may be up and that precautions against a surprise attack need to be taken.

### Dangers in calling alerts.

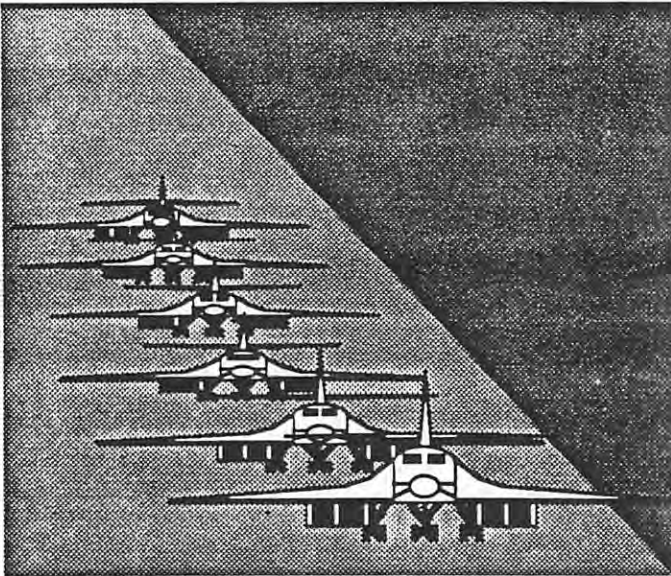
The problem with such alerts in time of crisis is that, while they are defensive precautions, they can be noticed by the other side and interpreted as possibly offensive. This in turn could lead the other side to increase its state of readiness, again a plausible defensive move, that could move the nations dangerously close to war. Calling frequent alerts actually degrades the equipment maintenance levels of certain forces, especially SAC aircraft.

### This Scenario.

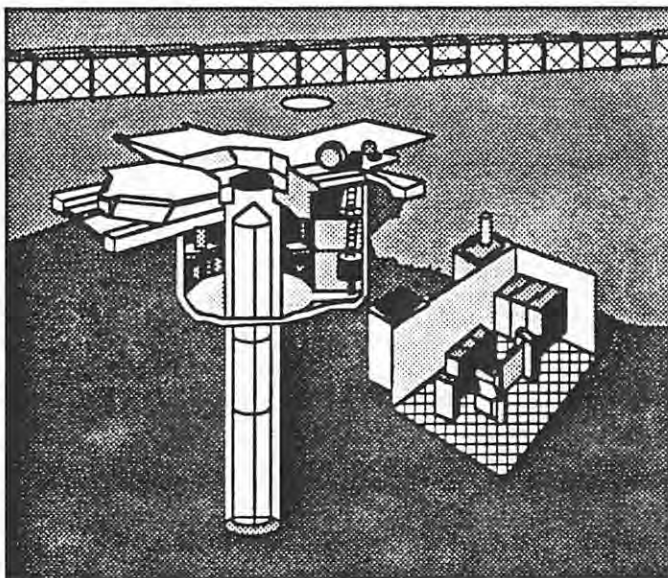
Apparent missile attacks on the U.S. are a procedural trigger for automatically raising the state of alert of some U.S. forces without authorization from the President or other National Command Authorities.

In this scenario, we assume that the Missile Display Conference determines that the next level of alert is justified.

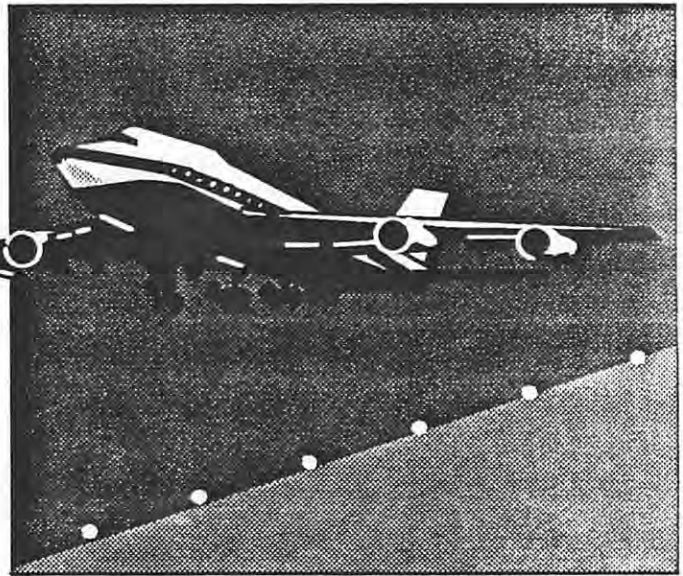
## SAC Crews Start Their Engines



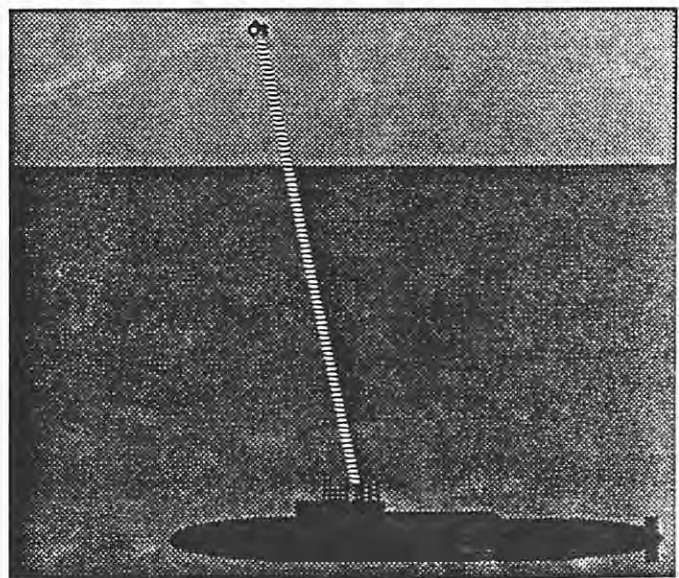
## Land-based Missile Crews Put on Higher Alert



## Battle Control Aircraft Takes Off from Hawaii



## U.S. Submarines Notified



**1:05 A.M.**

## Radars Detect Submarine-Launched Missiles

### Description and Location

The U.S. has three giant phased array radars whose primary job is to spot submarine launched ballistic missiles. They are two PAVE PAWS radars located on Cape Cod, Massachusetts and in northern California. The third, called COBRA DANE is on Shemya Island, Alaska. These missile stations gather data which computers analyze and display for human analysts. They can also be used to confirm attack reports by satellites and other radars. Two additional phased array radars are under construction in Georgia and Texas.

### Range

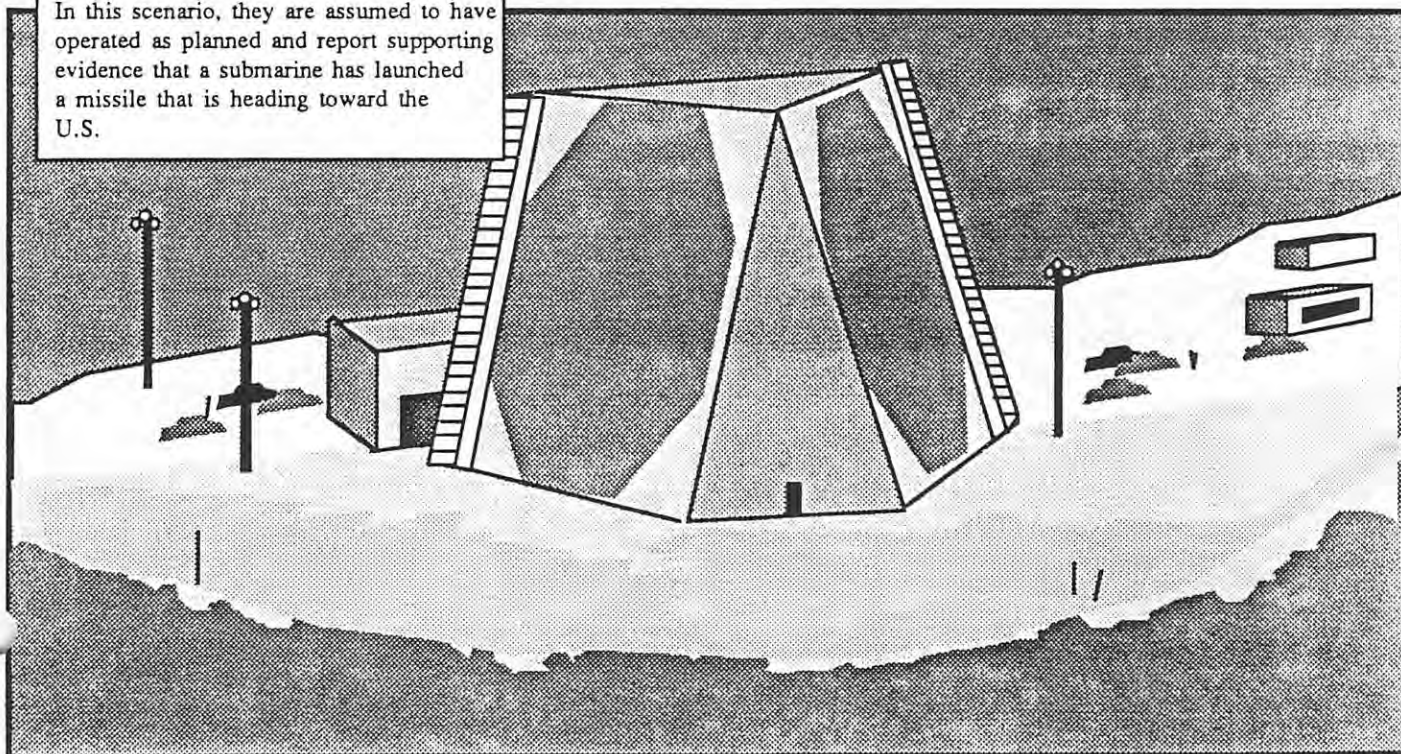
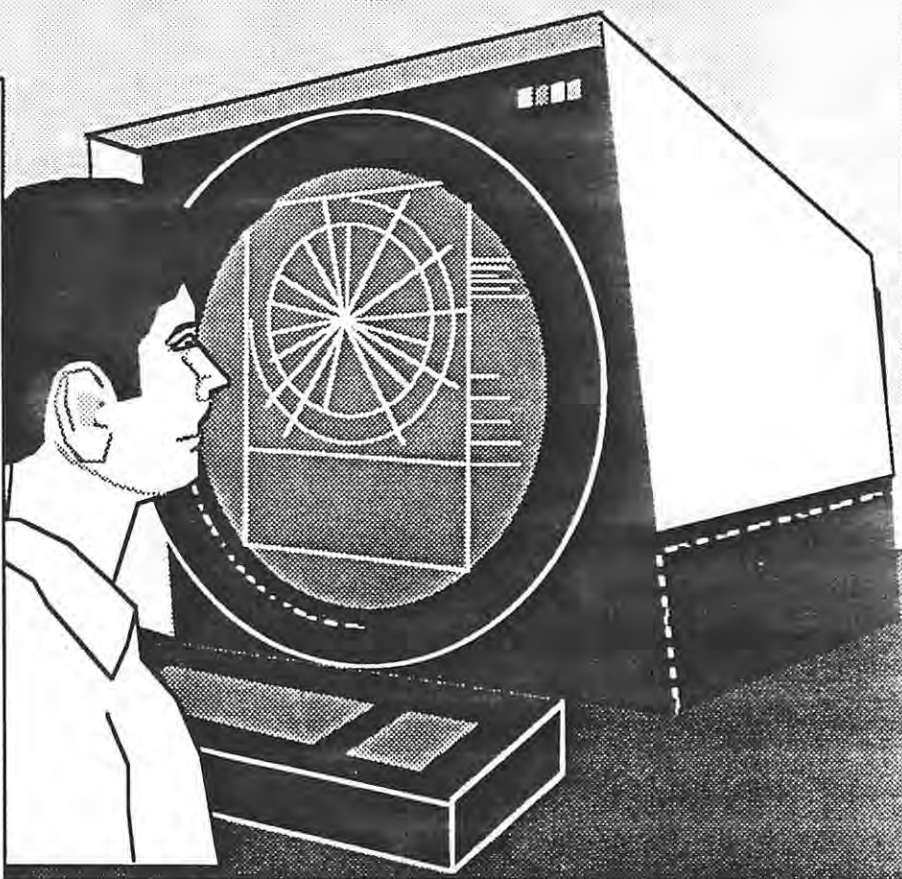
Their effective range has been estimated at 3,500 miles, about half way across the Pacific Ocean.

### Effectiveness

They can indicate that there is an attack but "They can't track everything at once. It is extremely difficult to arrive at any decent count of warheads."

### This Scenario

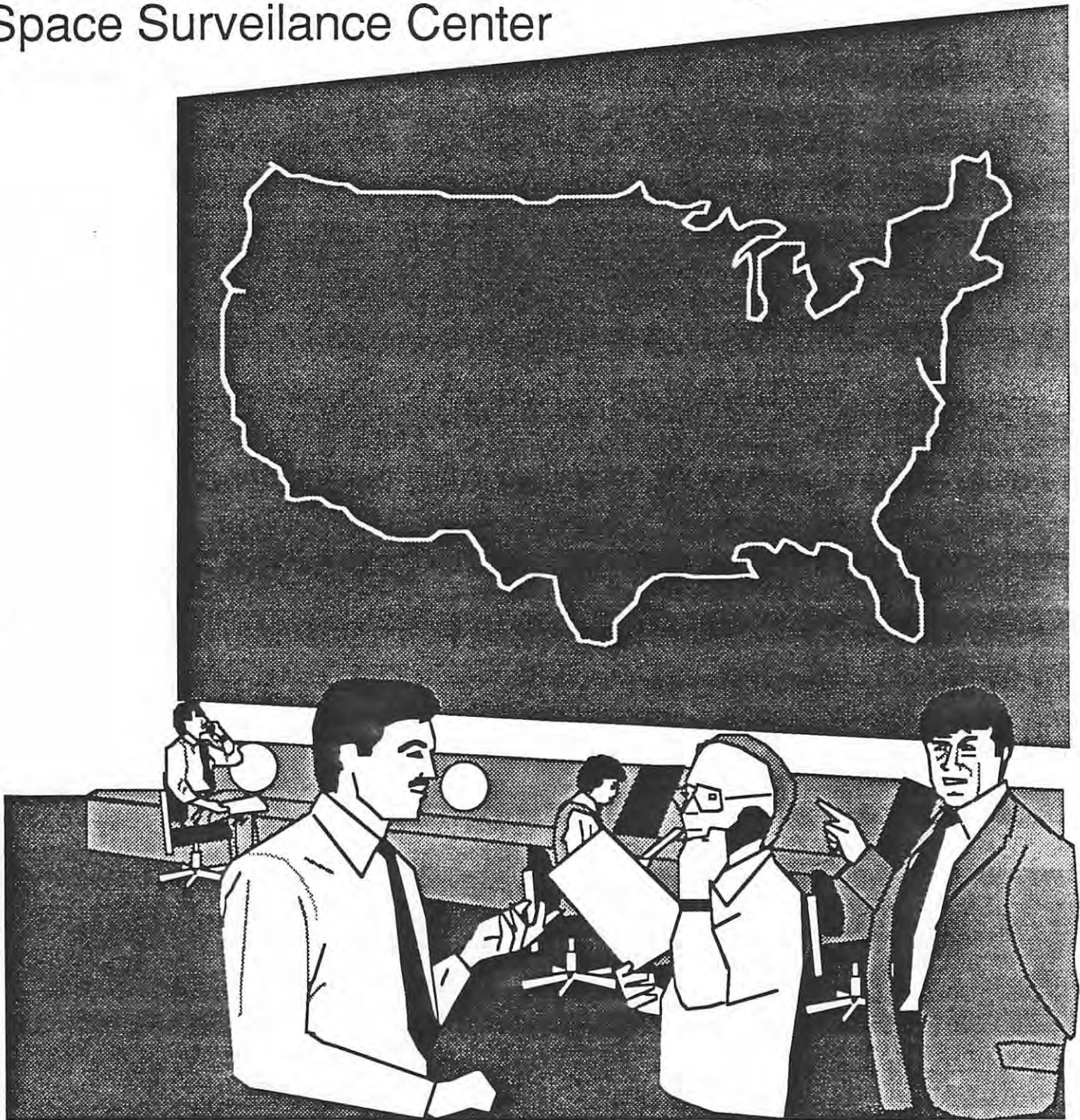
In this scenario, they are assumed to have operated as planned and report supporting evidence that a submarine has launched a missile that is heading toward the U.S.





**1:06 A.M.**

## NORAD staff double checks warning with Space Surveillance Center



### **Description and Function**

The Space Surveillance Center is in a room next door to NORAD at Cheyenne Mountain. Its job is to keep track of all of the objects currently orbiting the earth. The objects include operational Soviet and U.S. satellites plus pieces of "space junk" from broken-up space craft. There are over 5,000 of these objects in orbit at any one time. They also keep track of astronomical phenomena such as sun spots and meteorites.

### **Importance**

One vital job of the Space Surveillance Center is to identify space junk as it re-enters the atmosphere and burns up. When this happens it appears on radar like an incoming missile. The Center has radio links to the USSR to tell them when both US and Soviet space junk is burning up.

### **This Scenario**

No correlation with space junk is reported in this scenario with the reports of incoming missiles on the other sensor system.

**1:07 A.M.**

## The situation so far

The NORAD staff has been continuously checking its world-wide sensors to determine if the country is under attack. This requires examining reports from the satellite and radar systems, which pick up data on different areas of the world. Here is a review.

### BMEWS Radar

The Ballistic Missile Early Warning System (BMEWS) is a line of radars scattered across Northern Canada near the North Pole. These radars can pick up missiles fired from the Soviet Union about 15 minutes after launch.

#### Situation in This Scenario So Far

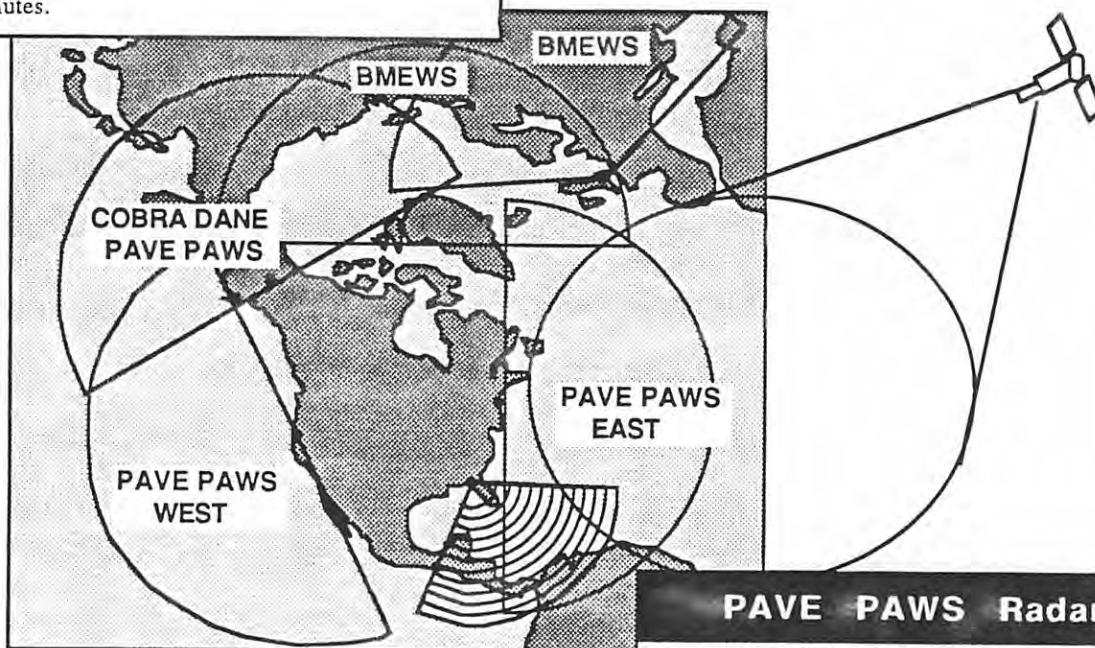
These radars have detected nothing. If the first launch detection was 7 minutes ago over the Atlantic, NORAD would not expect a detection from them for about 7-8 more minutes.

### DSP Infra-red Satellite

The infra-red satellite give the first report of a potential launch. Three of them are located in relatively stable orbit over the equator, able to detect the heat of rockets from missile launches.

#### Situation in This Scenario So Far

One of these satellites has given a signal that a missile has been launched over the Atlantic. Unknown is if it is only one or several missiles.



### PAVE PAWS Radar

Two PAVE PAWS radar systems look out over the Atlantic and Pacific and a third in Alaska looks toward the Soviet Union. Their primary mission is to detect submarine launched missiles and secondarily to confirm other incoming missiles.

#### Situation in This Scenario So Far

PAVE PAWS radar at Cape Cod, Mass. has detected an incoming missile from the Atlantic.

### Forces on Alert

#### Situation in This Scenario So Far

U.S. forces have been raised one level in alert, including:

- approx. 70 B-52s of the Strategic Air Command, whose crews have been sent to their planes and have started their motors
- approx. 40 submarines, with nuclear missiles, are on duty under the oceans at all times
- the launch officers of 1,000 intercontinental ballistic missiles buried in silos across several Western states
- special communications aircraft for communicating with the submarines are airborne
- special command aircraft for communications and backup if underground national command centers are destroyed.

**1:08 A.M.**

# Threat Assessment Conference Determines High Probability of Attack--Plan to Assemble High Level Leaders Implemented

## Description

The Threat Assessment Conference takes place on the phone among the duty officers at key defense locations and their commanders who are available. It is the next formal stage beyond a Missile Display Conference. At this conference the data are evaluated and the decision is made whether the next--and highest--level of conference should be convened. The Commander in Chief of NORAD, an Air Force General makes the decision and on his desk is the phone that links him with the top leaders of the nation.

## Decision Making

The Threat Assessment Conference must determine that a threat has been reported by at least two independent systems--the so-called dual phenomenology requirement. So far as is known, this level of conference has never made the decision to alert National Command Authority. If they do go forward with an alert they are required to provide a confidence level assertion regarding the attack.

## This Scenario

Double checks of possibly malfunctioning equipment have been made and this scenario continues to assume that there is a valid detection of an incoming missile.



We have the same reading you have NORAD. We have a reading of a missile launch from somewhere in the Atlantic from DSP West and PAVE PAWS at Otis AFB Massachusetts confirms an incoming trajectory.



We have same the same information NORAD. We have no other intelligence on unusual Soviet military movements or alerts. NSC gives me a negative on any unusual Soviet communications. Political assessment. You know it as well as I do. It's not any different than the newspapers, sir. We're telling the Russians they better keep their hands off the Persian Gulf.

Submarine launched missile is what we'd expect from a Soviet attack. And, of course, the equipment won't tell us how many. It's now approx 8 minutes since we detected them. That means there could be explosions all over the place in less than 5 minutes. Washington could have already been hit, if they launched 8 minutes ago. For that reason I have reservations that we have a 100% confidence level of attack. I would place our confidence at 50% maybe 60%.



We have a negative on any further launches. However we are not sure if DSP East is working properly. We have a report that the satellite downlink station at Nurrungar, South Australia is having difficulty. Too early to tell whether it's the satellite, the station, or the communication links. It is one of those normal glitches. It is too early for the early warning radar to be reporting if there was a coordinated launch. However we do have a case of dual phenomenology...at least two systems confirm a possible attack. For me that's better than 80% confidence. So I am determining that we must contact the National Command Authority and convene a Missile Attack Conference.



1:09 A.M.

## The President is Notified

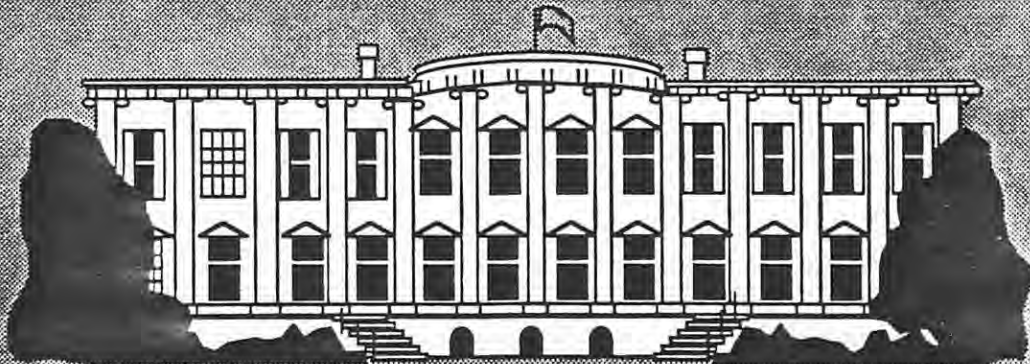
Wake the President.

It's one o'clock at night!

Wake him. We don't have much time.

I have to know why. He was up until an hour ago in the Situation Room with the Emergency Planning Committee. He has had about 4 hours sleep for the last 3 days. And he'd not a young man any more. I don't just wake the President every night without a good reason.

Wake him. We have a confirmed nuclear attack on the U.S.

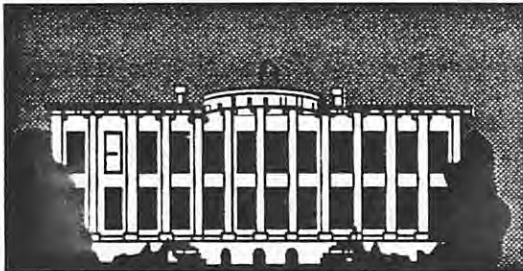




1:11 A.M.

# President Informed of Attack

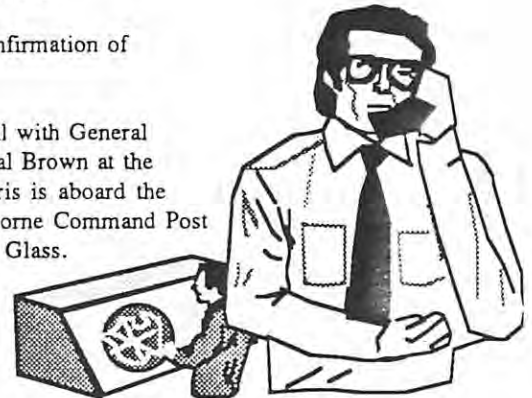
What do we know?



NORAD has detected infra-red emissions that indicate a missile launch. The launch has come from a submarine in the Atlantic. We have radar confirmation of at least one incoming missile.

We do not have radar confirmation of any ICBMs yet.

We have a conference call with General Smith at NORAD, Admiral Brown at the Joint Chiefs, General Chris is aboard the National Emergency Airborne Command Post aircraft, we call Looking Glass.



How much time do we have?

Depnds on what is happening. Less than 10 minutes. How much less we don't know. Washington could be hit from submarine in less than ten minutes.

Where is the Vice President?

In Chicago, sir, for a speech. We have contacted him and are trying to get him to a command post.

And the Secretary of Defense?

In an aircraft flying back from China, sir. Sir, I have to ask you if you will delegate your authority to respond should Washington be hit.

Yes, no question about that. We have to use plan--what's it called?

Sir, your National Security Directive says that if you are killed in a massive attack on the United States, a subordinate can be told what to do.

Yes, that's the one. Admiral Brown, General Smith, General Chris. That is the order.

1:12 A.M.

# President Opens the Hotline to Moscow

Is the Hotline to Moscow operating? Who do we have there?



It is working. All we have on their end is a staff officer. Is there a message you want to send?

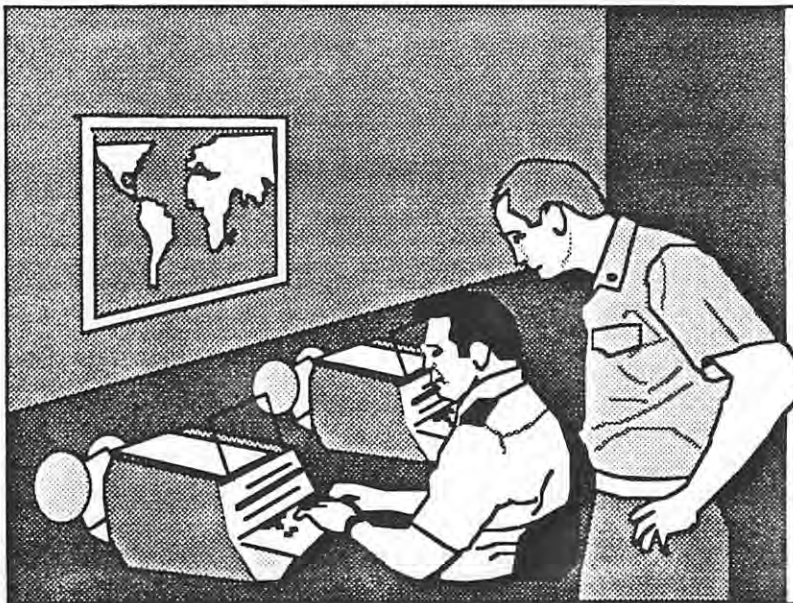
To the General Secretary. We have reports of an incoming missile and have detected missile launches. We will retaliate, but only to the extent that you have attacked us.

You've made a decision, sir, as to the level of response.

No I haven't. I have just opened a channel of communication. Is there any response from Moscow?

No, sir. That usually takes a few minutes.

We haven't got a few minutes. Send that message again.



## Description and Functions

The Hotline has never been a "red telephone." It is a telex machine located in the National Military Command Center in the basement of the Pentagon with a link also to the White House. In service since 1963, it operates through two satellites, one U.S. and one Russian.

Military officers and translators in each country are on duty 24 hours a day. The Hotline is checked daily to ensure that it is fully operational.

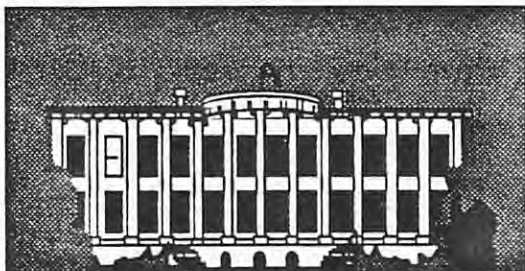
## This Scenario

In this scenario, the President attempts to use the Hotline, but there is no other than routine response, "We have received your message."

1:13 A.M.

# President Reviews His Options

What are my options?



If you are looking at the Black Book, sir, you will see you have the following options:

1. Determine that a full scale attack has occurred and use one of your MAOs, excuse me, sir, your Major Attack Option. With this, you retaliate with our entire ICBM force, send our SAC bombers at the Soviets and launch some submarine missiles. Hold some submarines in reserve. This is your so-called Launch on Warning or Launch Under attack option. There are no further choices you make under this option.

2. Your other Launch Under Attack option is Limited or Selected Attack Options. You determine that an attack has been made and launch all or some ICBMs, send SAC to attack-ready positions, and hold submarine missiles in reserve until we get more information. If you chose this option, you have four choices:

A. Small response to indicate resolve. It hits only some Soviet ICBM silos. Holds most of our ICBMs in reserve.

B. Response to indicate resolve and escalate. It hits most of their major military bases. Holds part of our ICBMs in reserve.

C. Major response. Uses all of our ICBMs. Hits all major military, strategic and conventional.

D. Major response. Uses all of our ICBMs. Hits all major military, strategic and conventional and hits their leadership.

3. Determine that a large attack has been made and we do not know its nature or extent, send SAC to attack-ready positions, but hold all ICBMs and submarines. This is a ride it out option.

4. Determine that it is not a full scale attack and ride it out, keeping the option to retaliate open to you or your successor.



That's it?

Yes, Sir. That's what it boils down to.

1:14 A.M.

# President reviews the Black Book

## Description

A military officer follows the President wherever he goes. The officer carries with him a briefcase, informally called the "football," which contains the authentication codes that the President would use to give orders to missile commanders to fire their weapons. The briefcase also contains "the black book" a 75 page briefing book prepared to assist him in decision making in this situation. Each day the National Security Agency changes the codes. And in every missile silo and strategic command post around the world, U. S. officers unseal their copies of the same codes of the day. They are called the "Gold Codes."

## Evaluation of the Black Book

Not much is known publicly about the black book. It is, of course, one of the most closely guarded secrets possible. But there have been several public comments about it. One official familiar with its contents is quoted by Daniel Ford as saying it presents the President "with an extremely complex, and virtually incomprehensible, set of choices. A senior officer who has worked on the option book said, 'No one who had not done an enormously thorough study of it and refreshed himself periodically could possibly understand what he was doing.'"

A former Director of the White House Military Office said that the book "...raises as many questions as it answers." He went on to say, "Not one President, to my knowledge, and I know because it was in my care, ever got an update on the contents of the Football, although material in it is changed constantly."

## What the President would see...

*From the public record, we know approximately the outline of the contents of the Black Book...*

*Depending upon the...*

### Alert Condition

<b>DEFCON 5</b>	Normal readiness
<b>DEFCON 4</b>	increased intelligence watch and strengthened security measures
<b>DEFCON 3</b>	an increase in force readiness above that required for normal readiness
<b>DEFCON 2</b>	a further increase in readiness but less than maximum readiness
<b>DEFCON 1</b>	maximum force readiness

*...and upon the...*

### President's Determination of U.S. Response

1. Launch on Warning
2. Launch under Attack
3. Ride it out

*...and upon the...*

### President's Determination of Attack Options

- Major Attack Option**  
(all out retaliation)
- Limited Attack Option**  
(specific destruction of military and industrial targets)
- Selected Attack Option**  
(selective targeting)
- Regional Nuclear Option**  
(destruction of leading elements of enemy forces)
- Withholds**  
(targets not to be attacked unless specified)

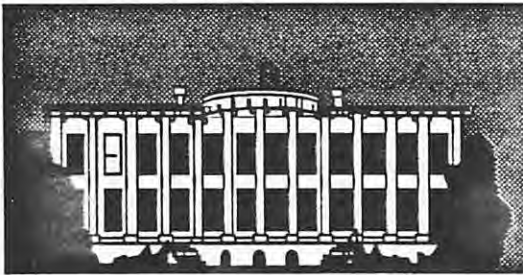
*...which would determine the specification of targets. and make a prediction as to the estimated damage...*



**1:15 A.M.**

## Isn't there more information?

Let me make sure I understand the situation. We do think we are under attack. We don't know how many missiles may have been launched. It might have been only one missile. But we know from radar that at least one is on its way here. Two independent verifications. Infra-red and early warning radar. When will we get more information?



But we don't know alot.  
Why have they done it?  
What does it mean?  
How many missiles have they fired?

And I don't know how much time I have to decide.

Sir, I confirm your appraisal of the situation. You have as much information as we have. When will we get more? Unfortunately, any time, sir. We don't know where it's headed.

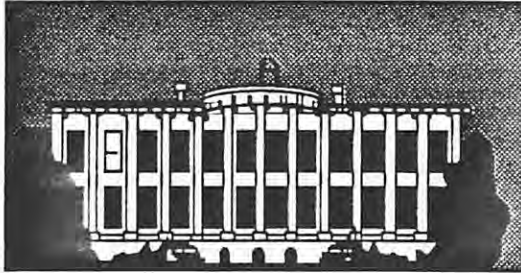


That we do know, sir. About 12 to 14 minutes have gone by since their first launch. We need about 10 minutes to execute our Emergency Action Message procedures decode, authenticate fire orders, and initiate launch sequence. And it will take about 5 minutes for us to launch them all. That means that, if they have launched their ICBMs against ours, you have to give the order to launch them now--or we may loose them. In short, sir, you have about 2 minutes to make that decision.

1:16 A.M.

# What do you recommend?

Admiral. What do you recommend?



Sir, I say we ride it out. You should get on the National Command Aircraft right away. Leave now. Don't fire any of our missiles until we can assess the damage. We just don't have enough information. We can always fire the submarine missiles and destroy their society. They know that and I know that our forces will be there to do it. If it is just a renegade attack, and if it hits just our ICBM fields. That's the world's worst disaster. We have built all this back-up equipment so that you don't have to blow up everybody in this country from one attack.



Thank you, Admiral. General. What do you recommend?

Sir, and with all due respect to the Admiral, I think that we may be under substantial attack. I say fire the ICBMs against their military establishment. If we don't use them, we lose them. Hold SAC and the submarines. Biggest reason: we have no confidence we could maintain our communications system and hence our command and control of our forces. We are not at all sure we could do a proper damage assessment, if they hit us hard.



Thank you, General. General Chris. Do you have anything to add?

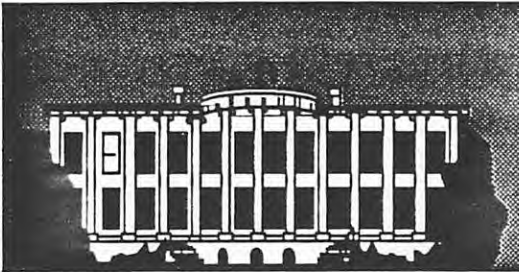


This is General Chris on the Looking Glass command aircraft. No, sir. Nothing to add. We're ready to do whatever you decide.

1:17 A.M.

# What should I do?

Yes, of course, I'm here,  
General...I'm thinking.



Sir, are you there?

Sorry, sir. I just had  
to make sure communications  
were working properly.



## Think about it for a minute.

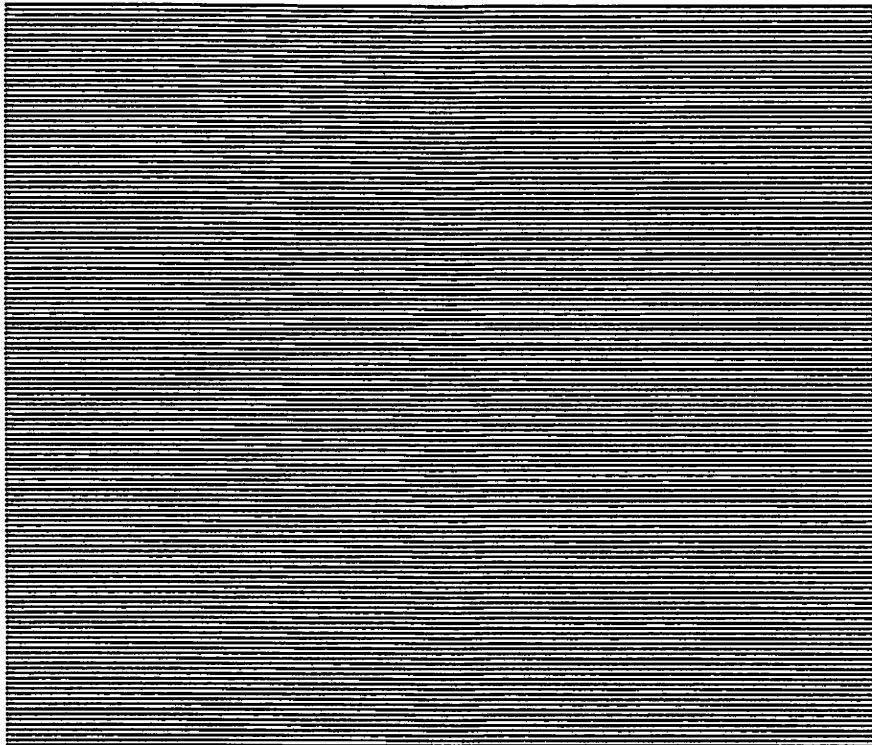
*But under the circumstances, the President  
wouldn't have longer than a minute to think...*

**The Scenario Branches Here**

There are several scenarios at this point,  
but basically they come down to a  
single choice.

**No Launch**

**Launch**

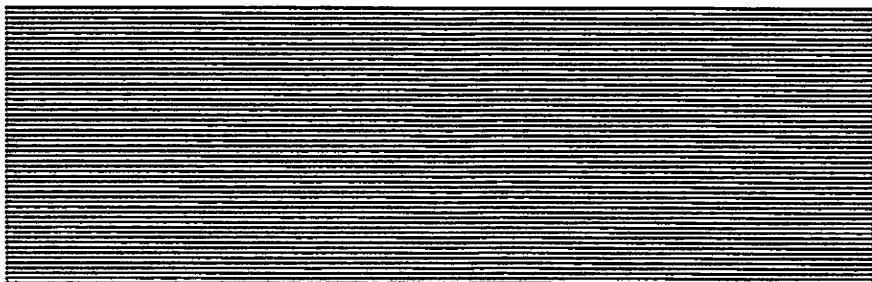


## Chapter 7.

# Arms Race Dynamics

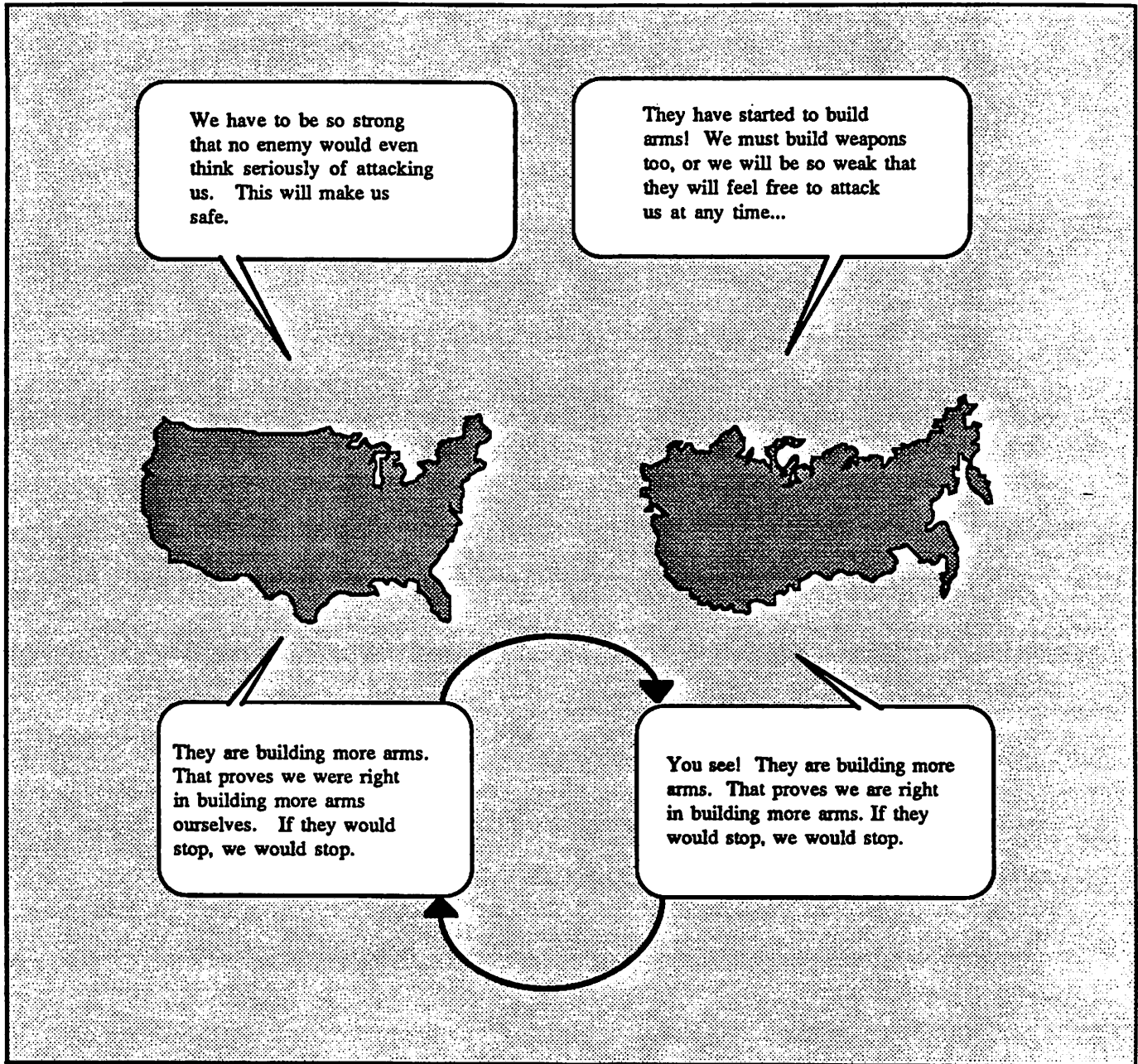
**This chapter summarizes many of the dynamics that have created the increases in numbers and quality of nuclear weapons.**

**...can credibility be maintained?**





# How Do Arms Races Get Perpetuated?



This is sometimes known as...

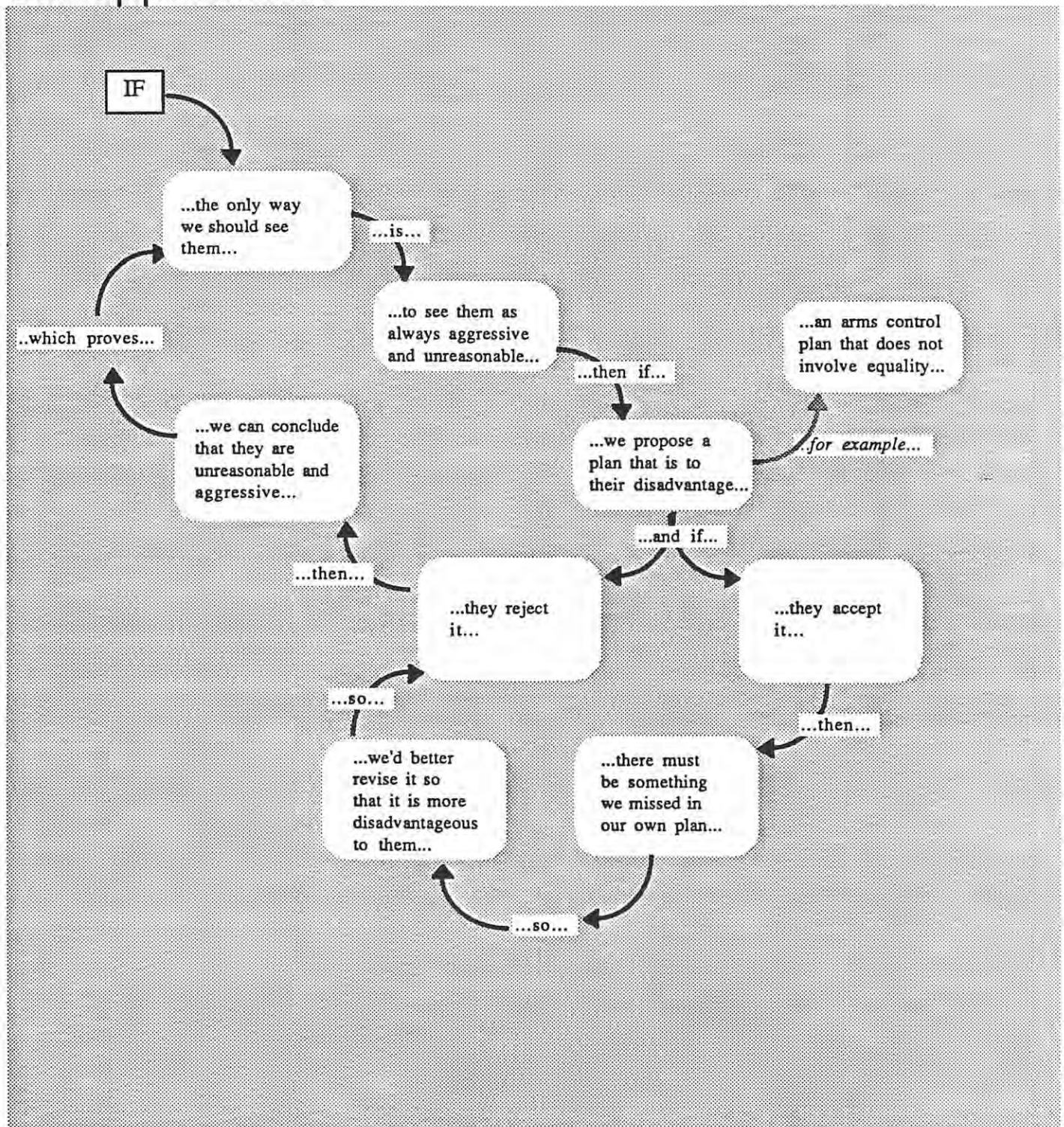
The

...if they would stop..

...we would stop if...

**Dilemma**

# How do we ensure that we are not fooled by our opponents?



This is sometimes known as the...

...one way to have opponents...

...is ...

...to keep on creating opponents...

...is ...

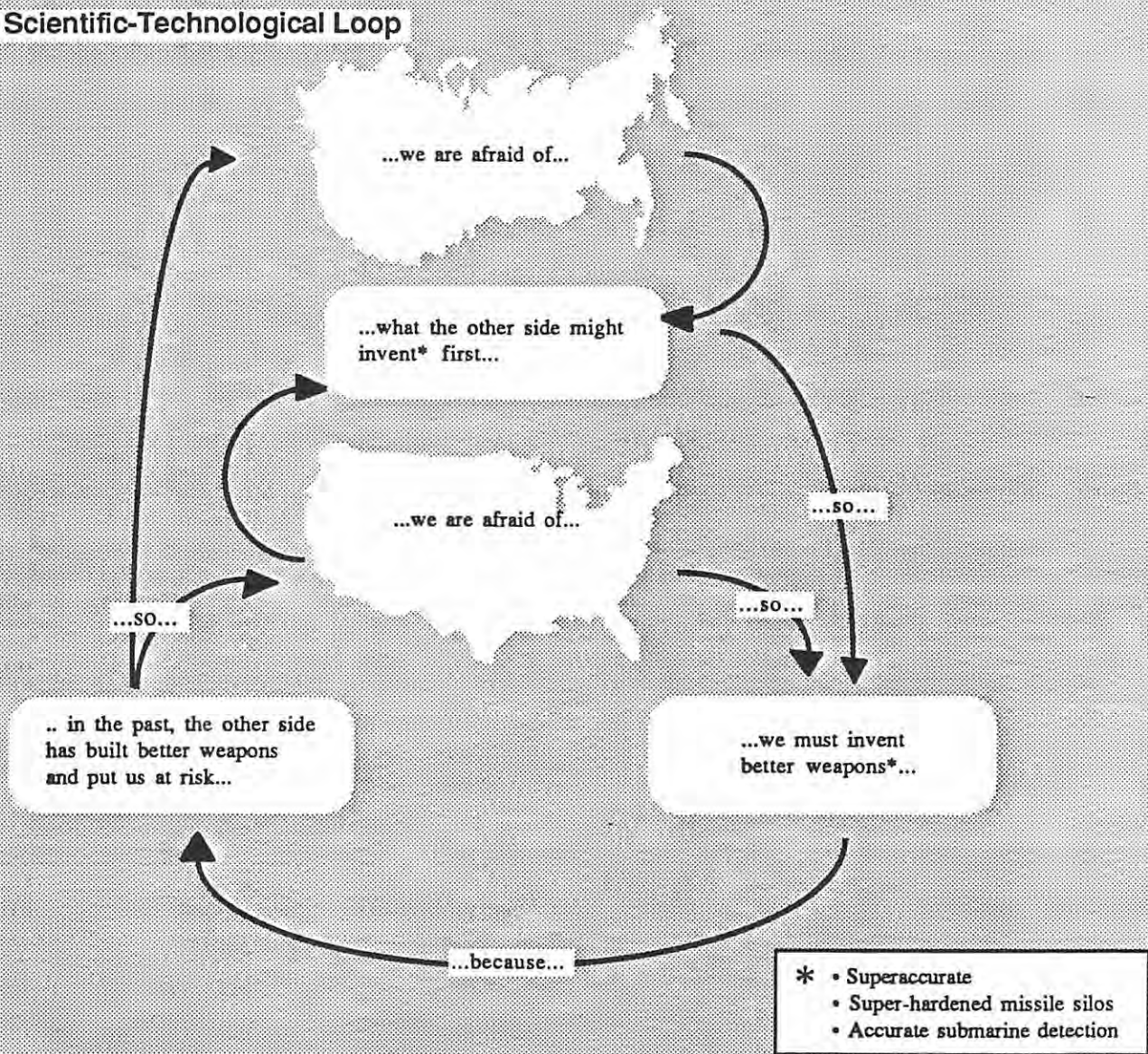
**Dilemma**



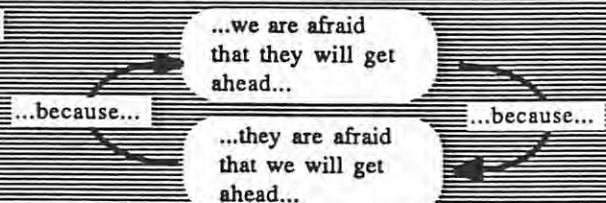
# Why don't we just stop building better and better weapons?

Improve military technology has been one of the driving forces of the arms race. But so has fear.

## The Scientific-Technological Loop

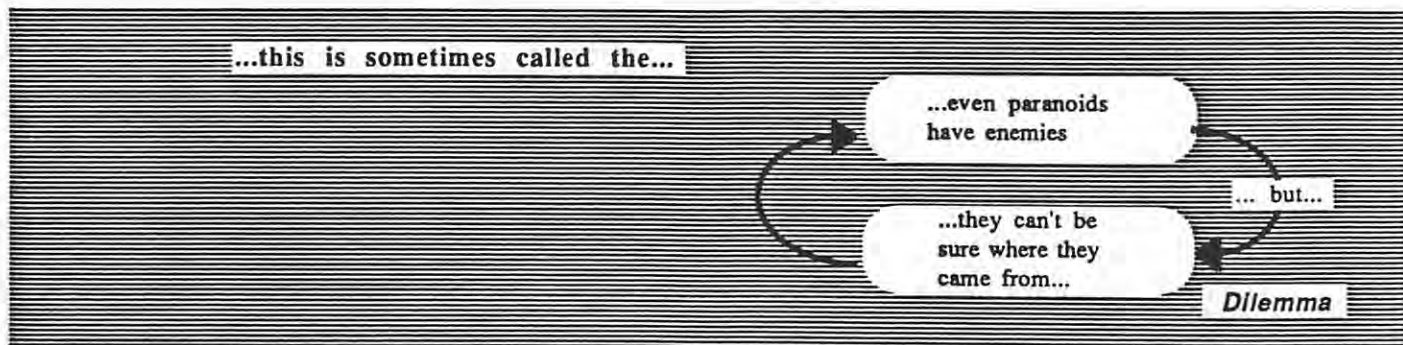
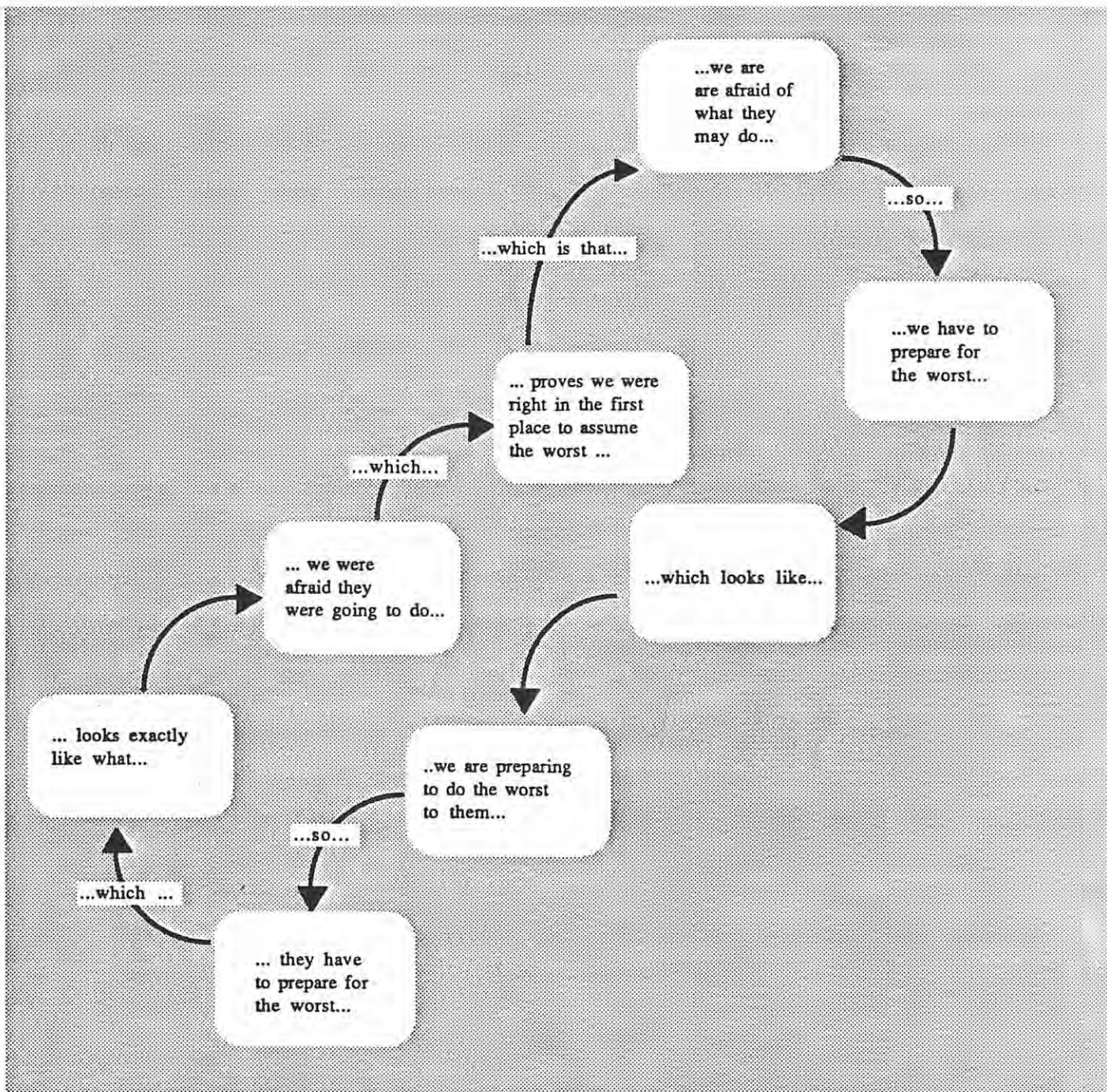


This has sometimes been called the...



**Dilemma**

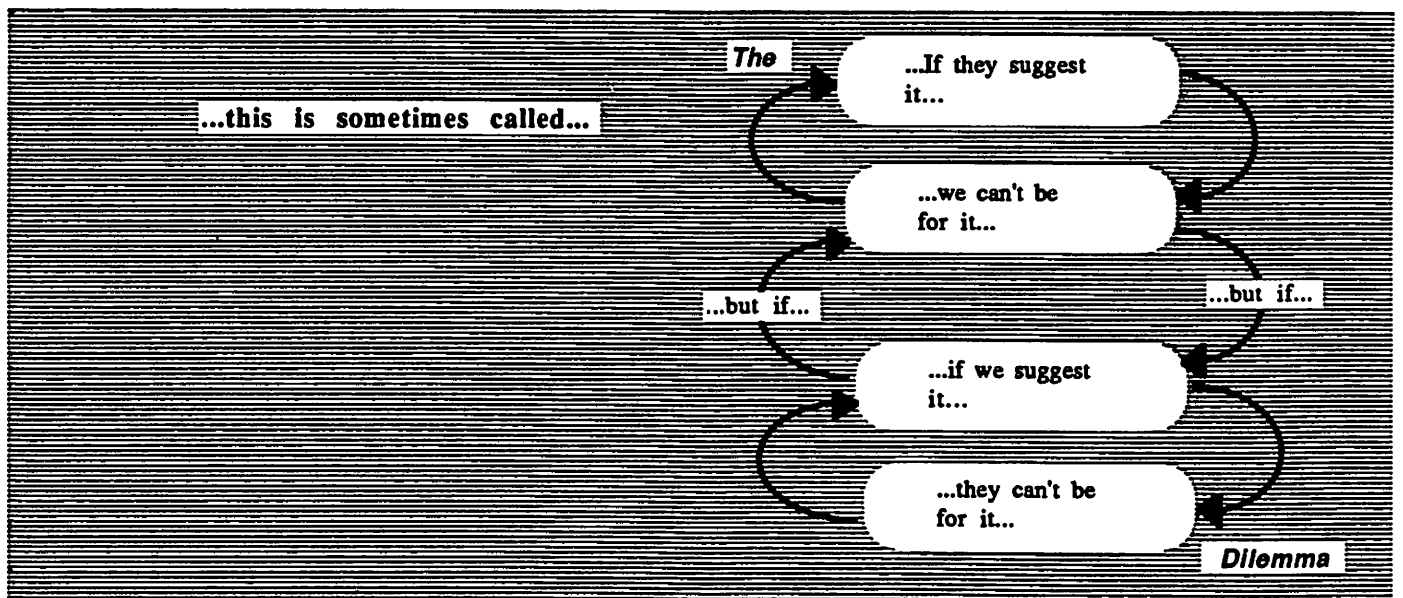
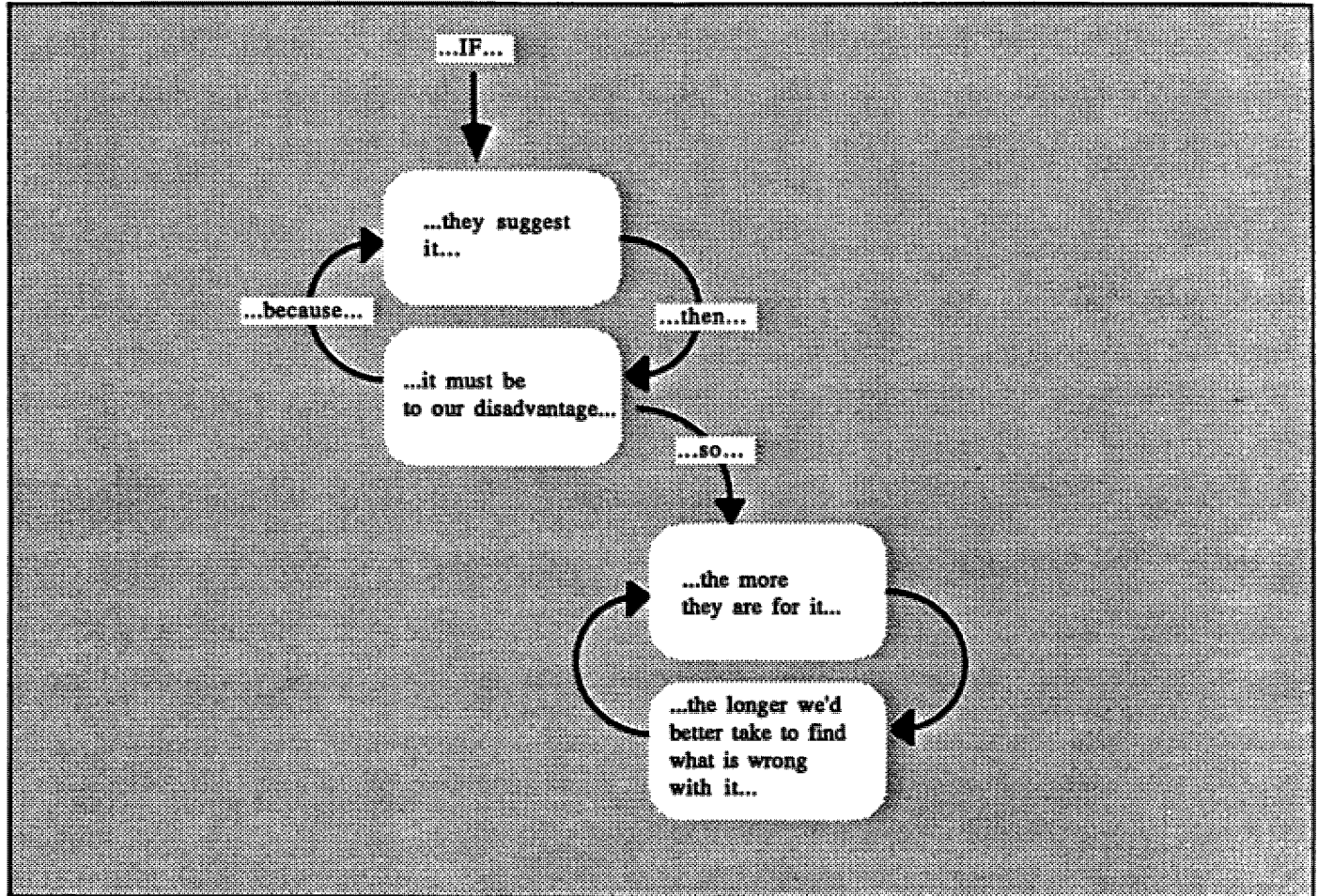
# Why do we do worst case analyses and what is their effect?





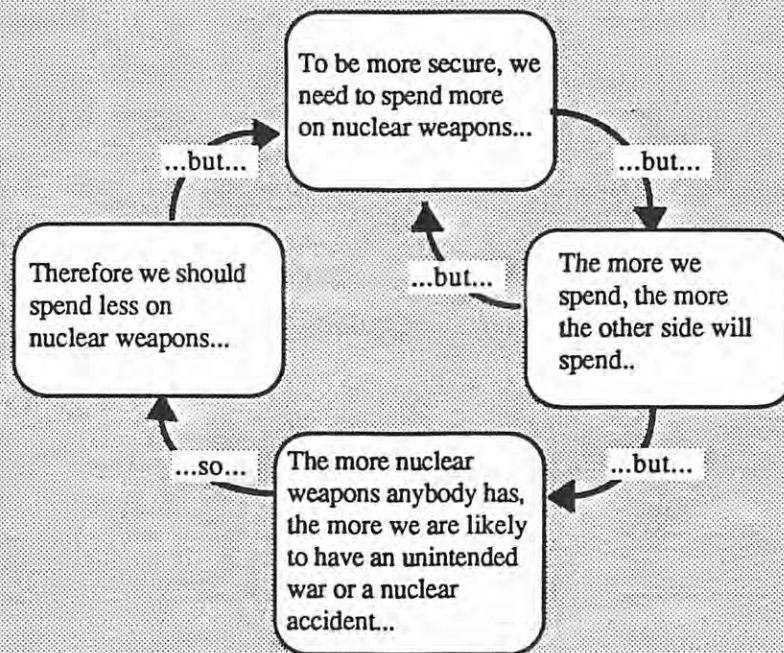
# What is standing in the way of our brainstorming some better solutions to these problems?

There are many difficulties when two nations sit down to negotiate.  
Not the least of them is the mutual suspicion loops that are  
often already in place or come into existence with little provocation.



# Why don't we just outspend the other side so that we can be extra secure?

Nuclear weapons have introduced a major change in the way we have to think about security. It can now be argued that each increase in the number and effectiveness of nuclear weapons decreases, to some degree, the security of both superpowers ...



This is sometimes known as...

The

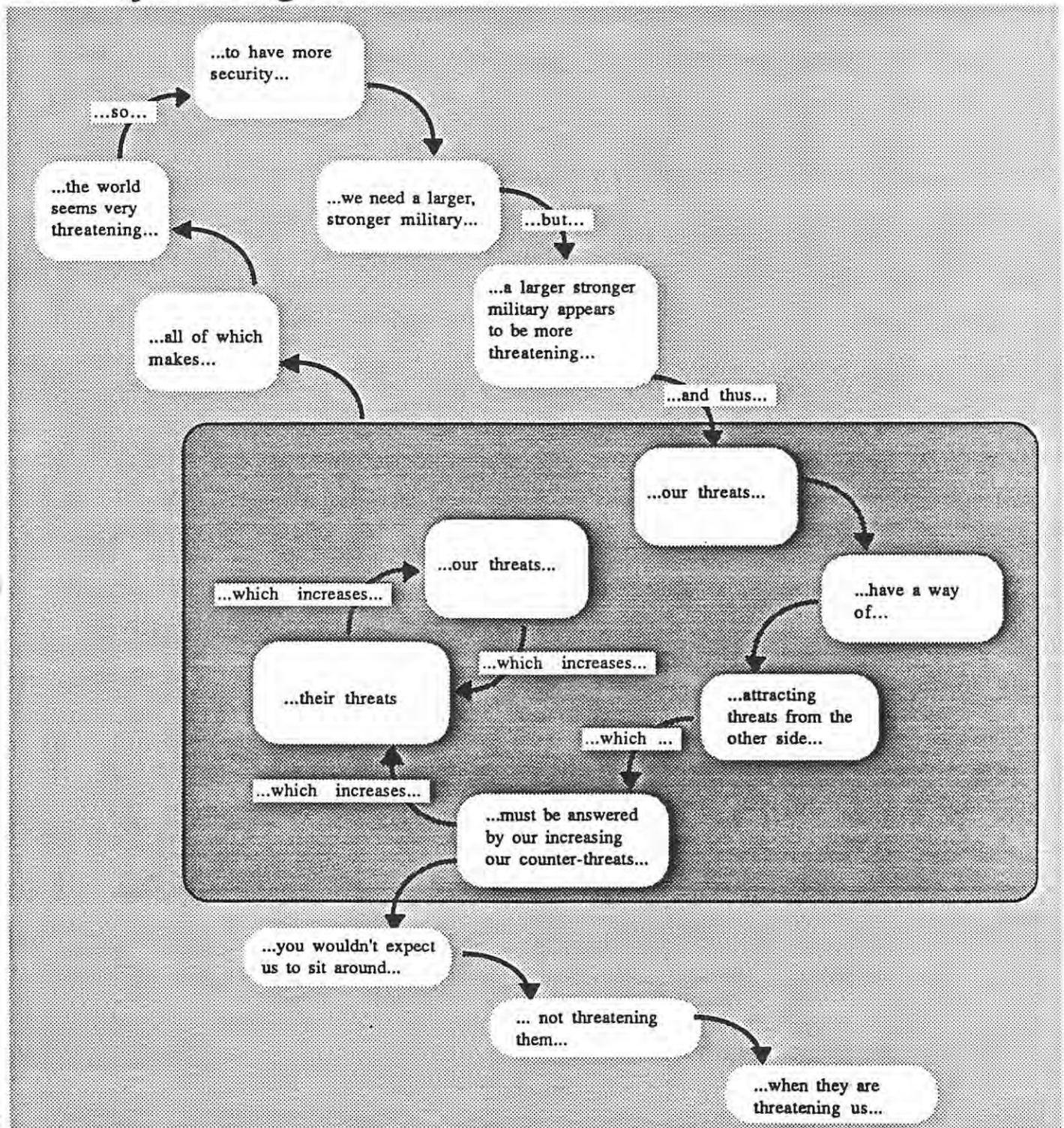
...more defense...

...less security...

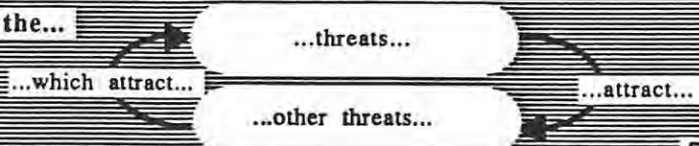
Dilemma



# Why is it that we continuously need more military strength?



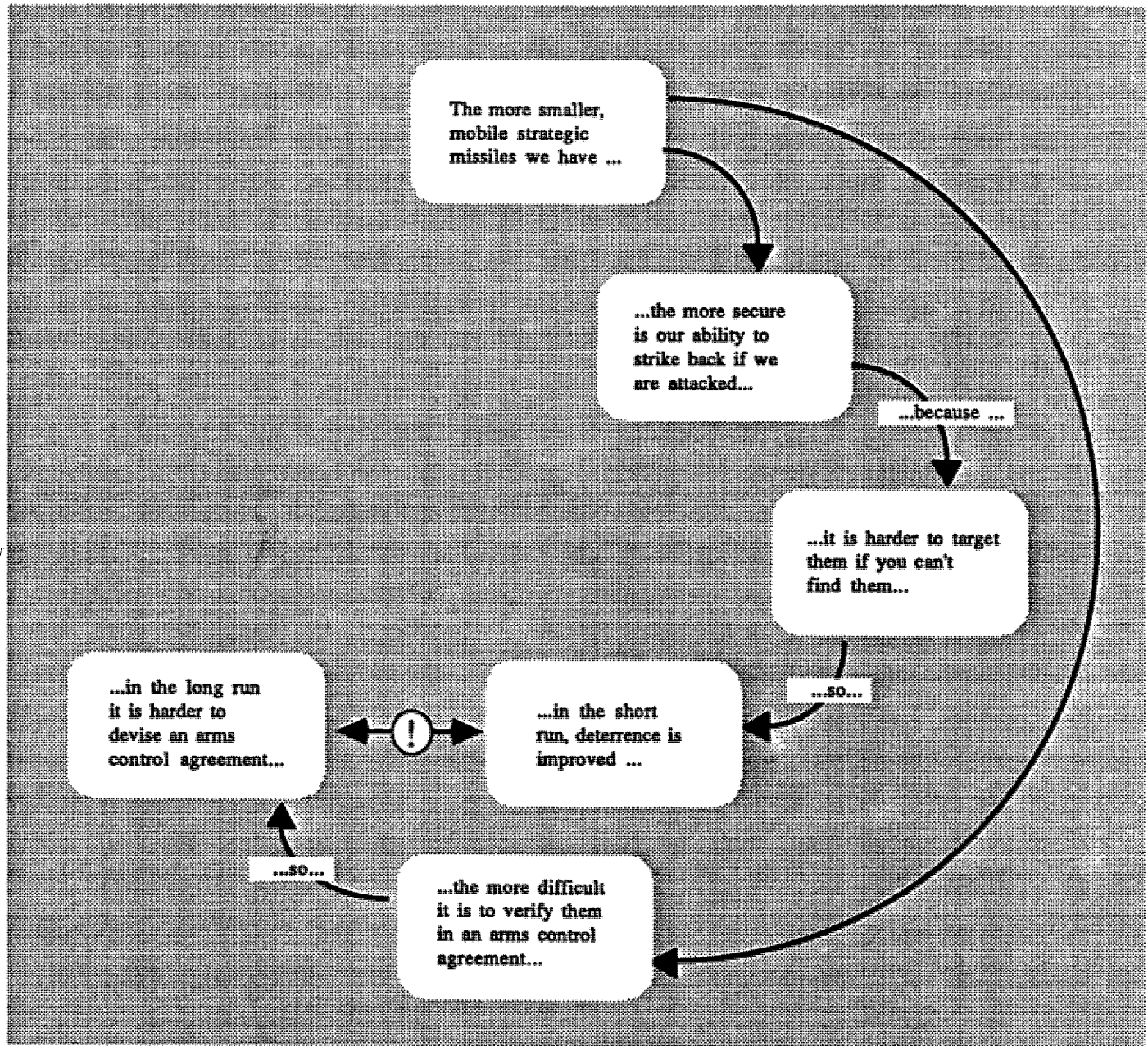
This is sometimes known as the...



*Dilemma*

# Would smaller, more mobile missiles improve deterrence?

It is possible to build smaller, single warhead, land-based intercontinental missiles that are mobile. They can be easily moved to different locations which increases the difficulty of destroying them.



...this dilemma is a variation of the familiar...

...damned if you do...

...and...

...and...

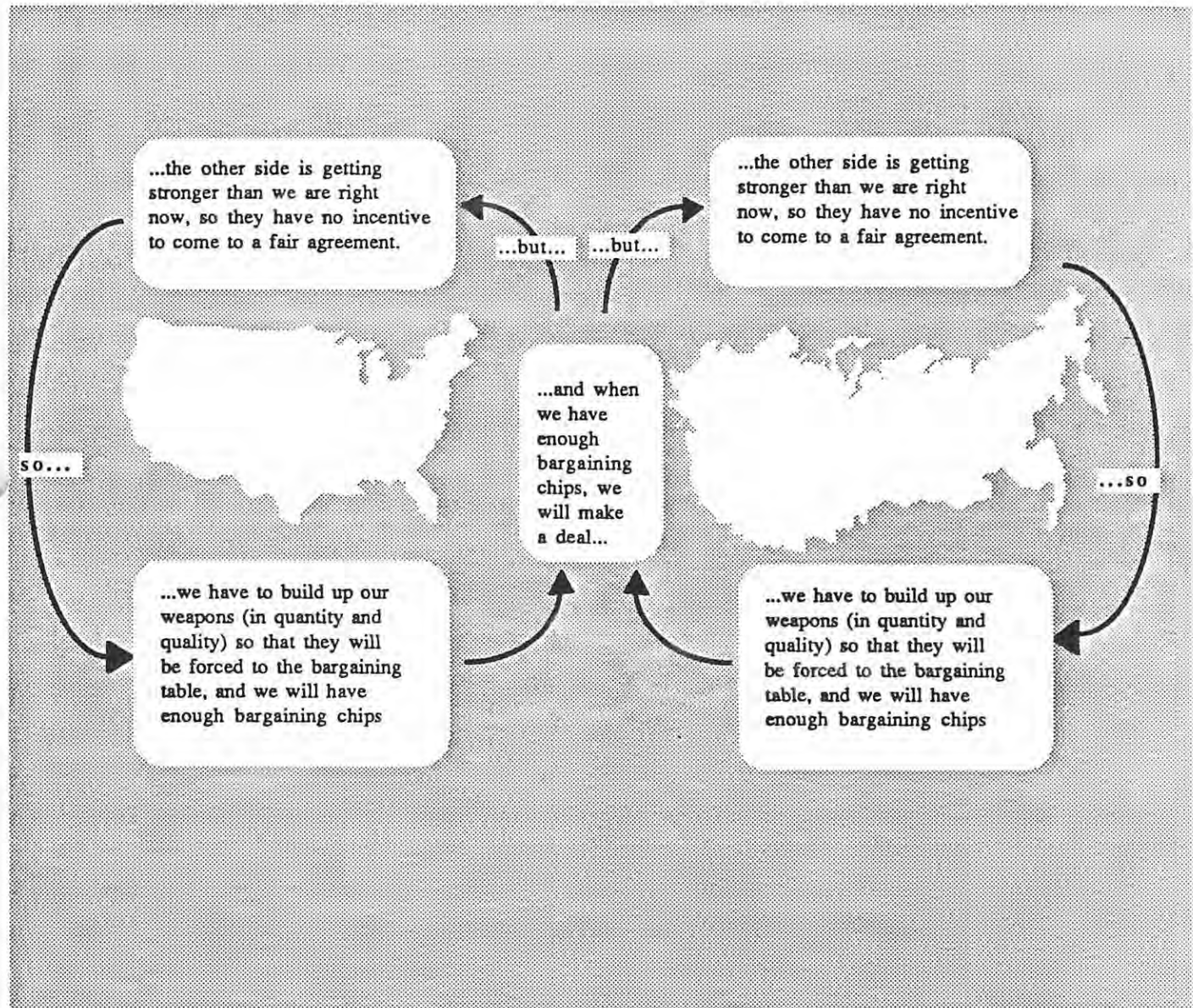
...damned if you don't...

**Dilemma**

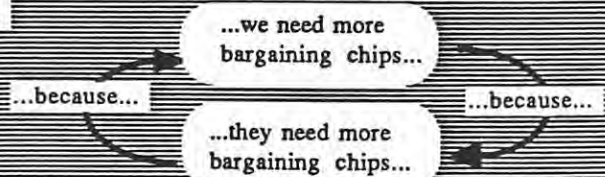


# Why don't we build more weapons and use them for bargaining chips?

The bargaining chip idea is sometimes advanced for continuing to improve nuclear weapons, delivery systems such as missiles and submarines, and even defensive systems.



This has sometimes been called the...

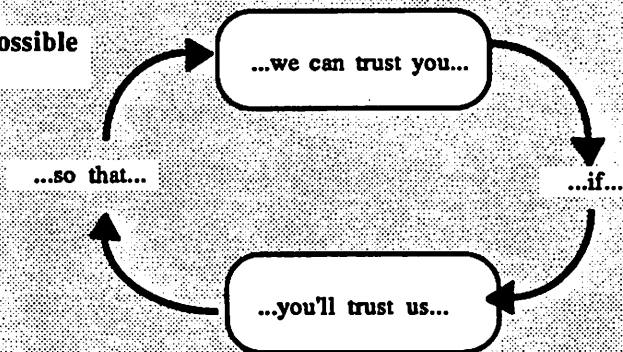


**Contradiction**

# Why does complete disarmament appear to be difficult if not impossible?

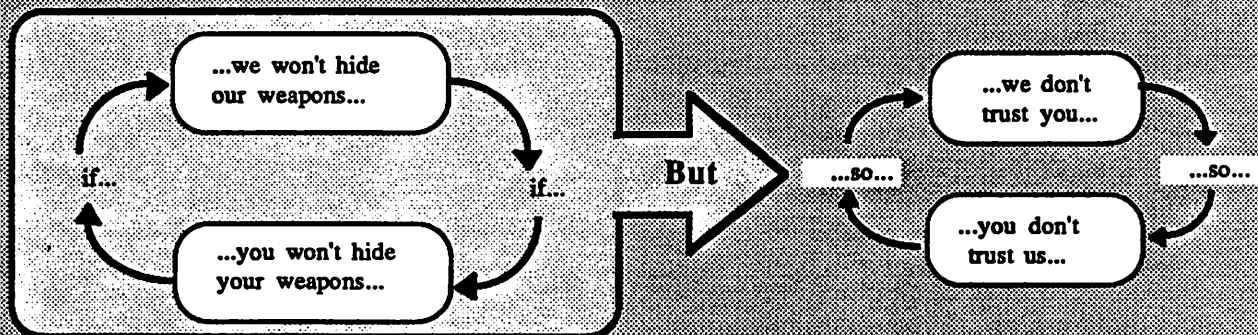
## Politically

Complete disarmament appears to be impossible because it is based on loops such as...



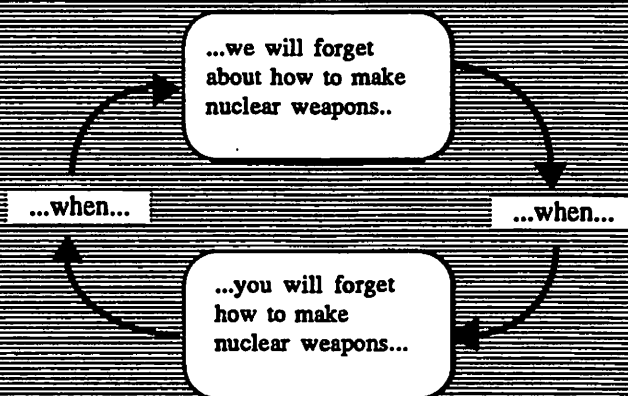
## Physically

Complete disarmament appears to be impossible because nuclear weapons can be hidden quite easily.



## Existentially

Complete disarmament appears to be impossible because nuclear weapons also exist in the heads of physicists...

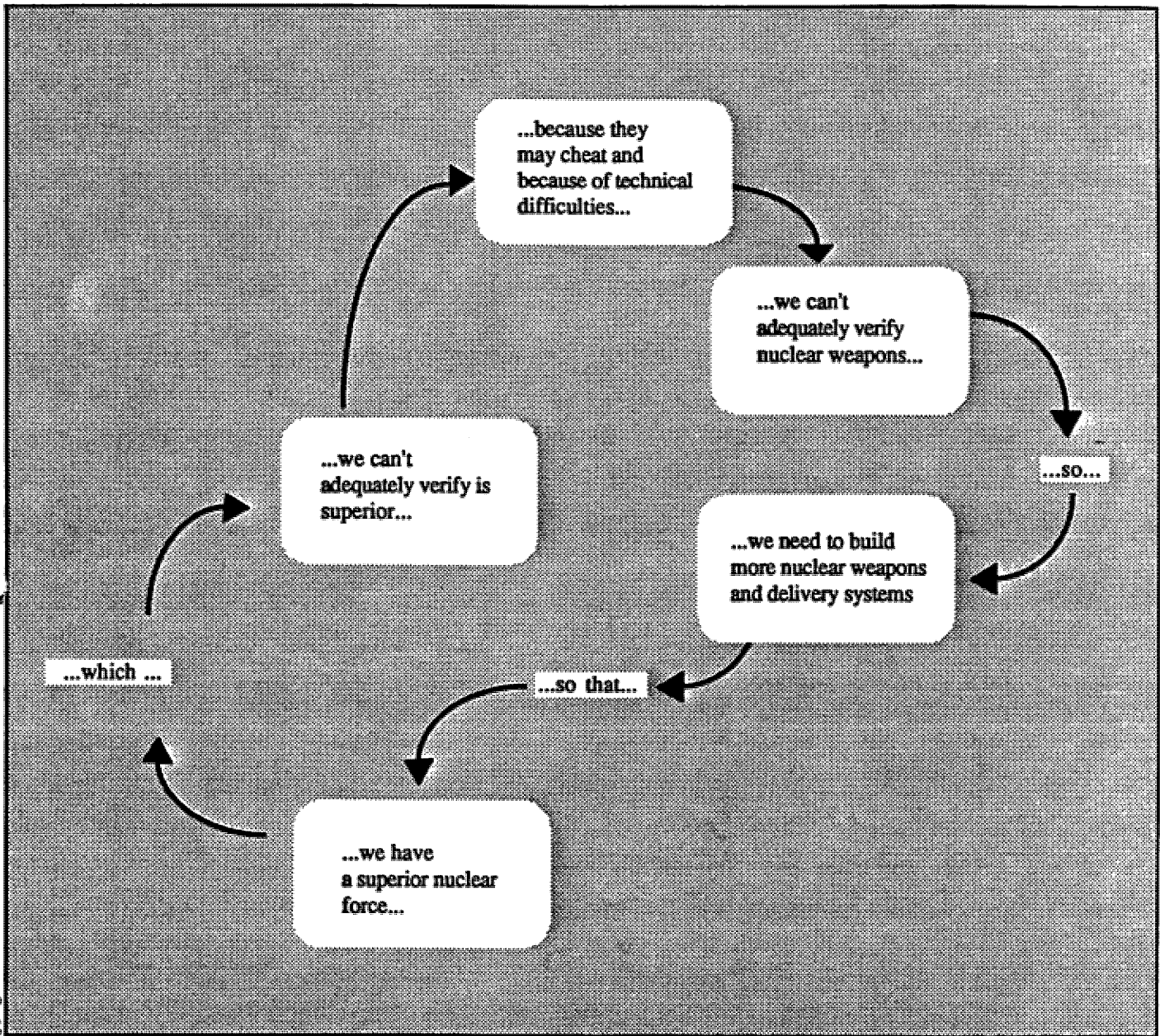


Note: Forty years ago it only took 3 years to invent nuclear weapons in the first place.



# Can we verify that they wouldn't cheat?

It is sometimes argued that arms control agreements calling for approximately equal numbers of weapons are unverifiable.



This paradox sometimes called...

The

...you can't verify  
superiority...

...if...

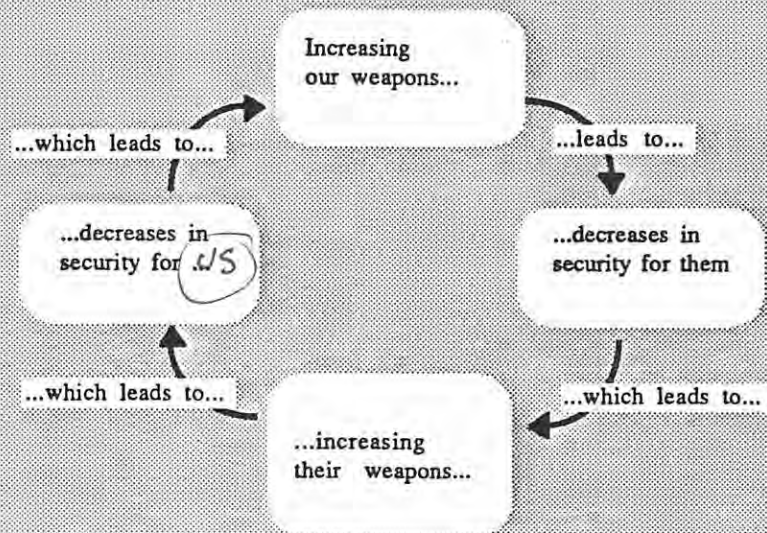
...you can't verify  
equality...

...if...

Dilemma

# Why is it that we can't seem to increase our security by increasing our weapons?

The "We Can Increase Our Security Independent of Anything They Do" theory produces...



This is sometimes known as the...

...increases in weapons...

...net decreases in security...

...can result in...

Dilemma

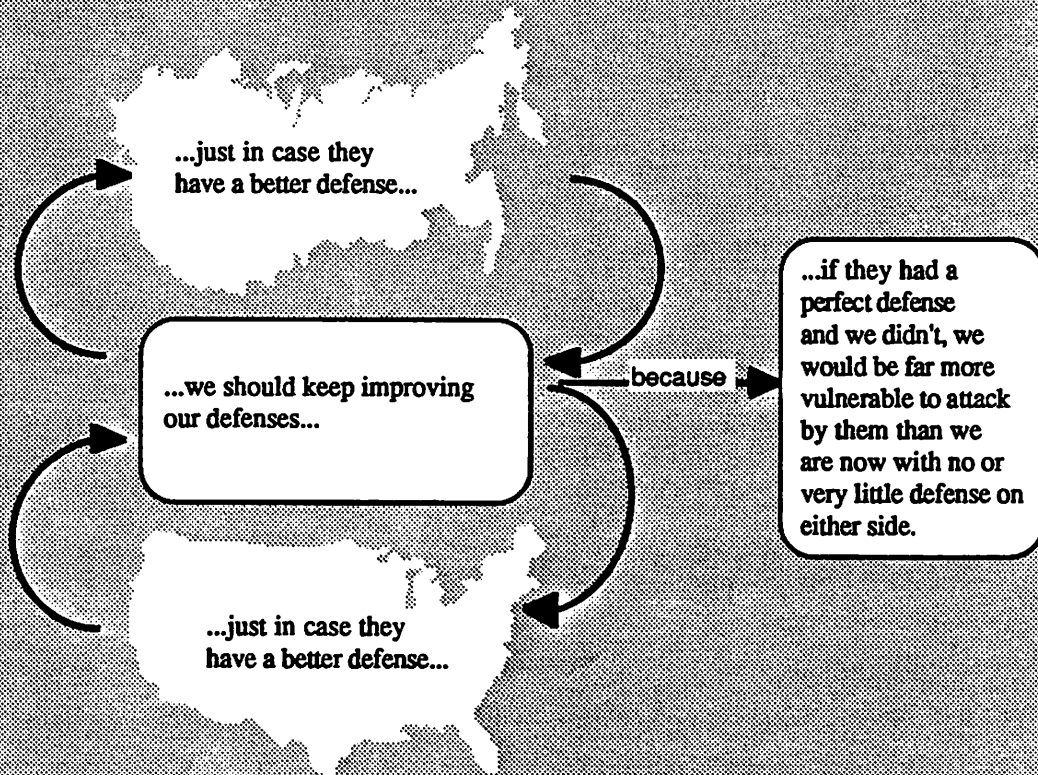
~~that~~ — that leads to



# Why don't both superpowers agree upon both of them having a perfect defense?

In many ways this would seem like the ideal solution to the dilemmas of nuclear weapons. But suppose both superpowers had equal and perfect defensive capabilities. Prudent military assessment requires a worst case analysis...

## The Worst Case Analysis of the Perfect Defense



This has sometimes been called...

The

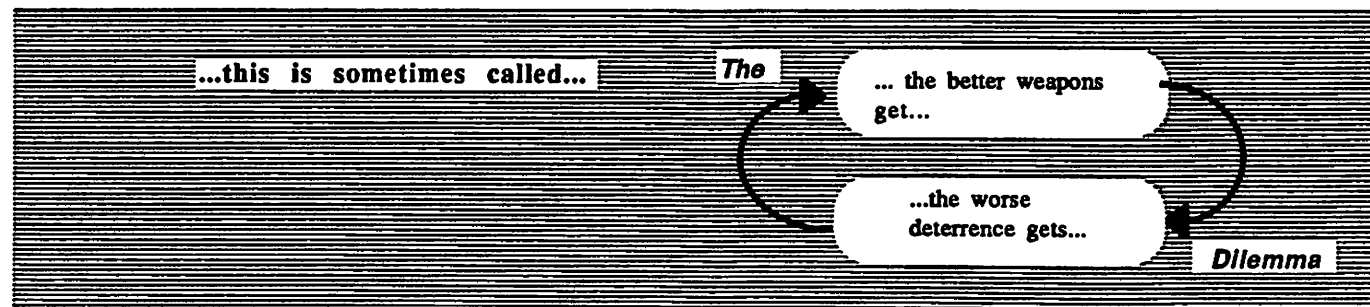
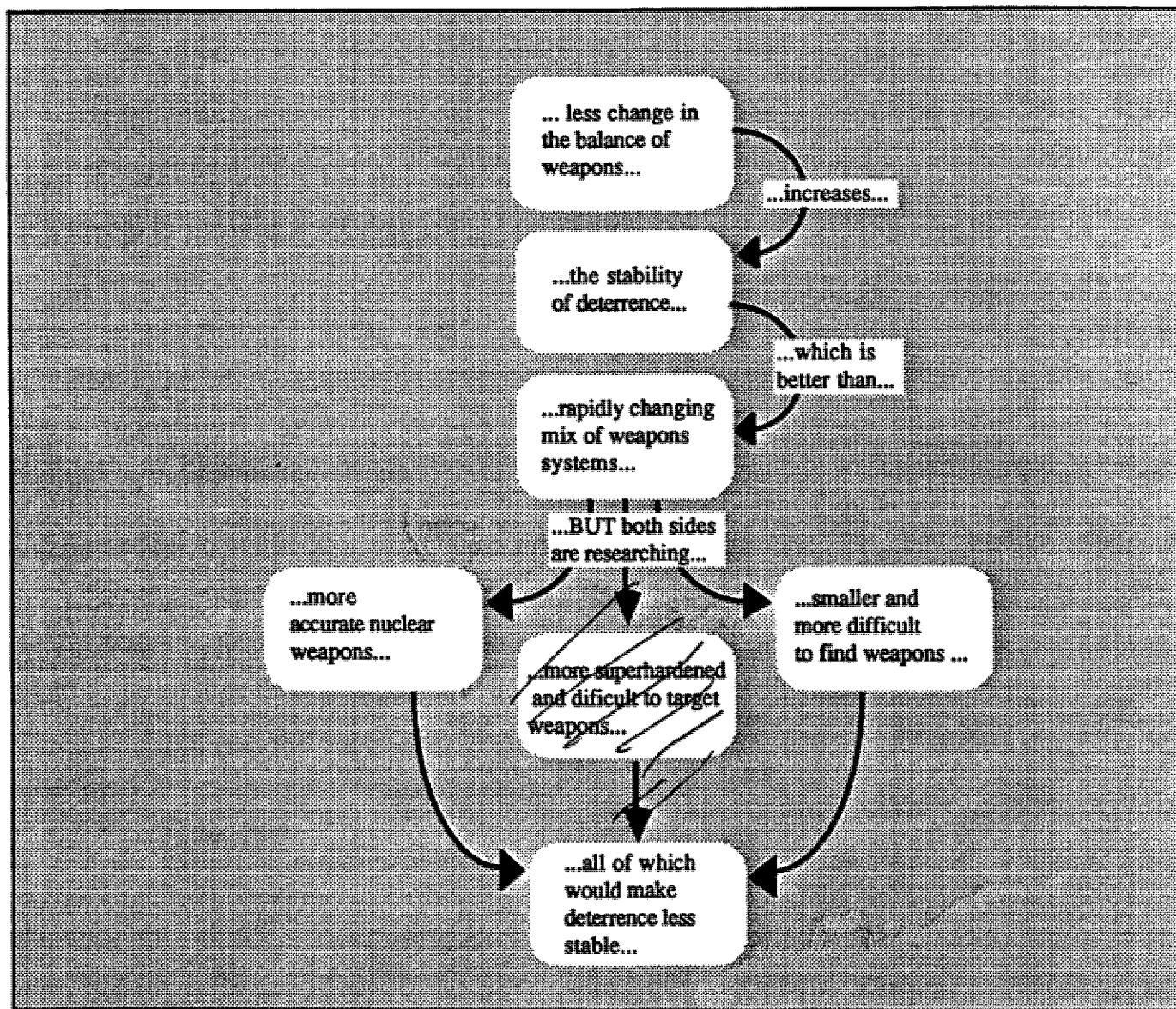
...perfect defense  
could never be  
believed...

**Dilemma**

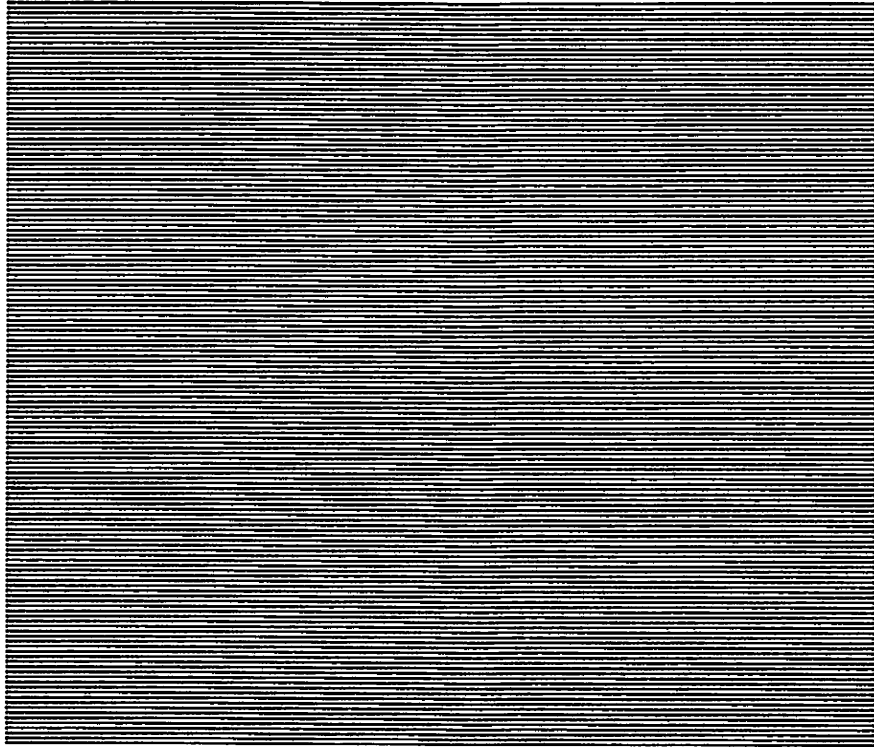
forces against  
stability

# Are some kinds of deterrence better than other kinds of deterrence?

It is generally agreed that a stable deterrence is better than an unstable one.  
A stable deterrence is one where there is little uncertainty about what weapon the other side has and how they would use them and relatively slow change in the balance of forces.

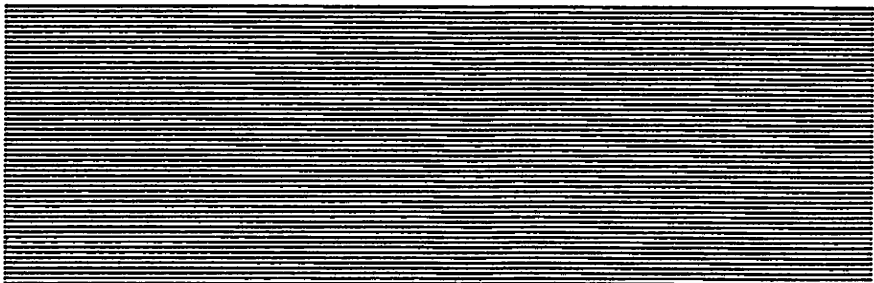


c



## Chapter 8. Allies and Limited War

**Much of the difficulty in establishing credibility  
in nuclear deterrence has come from  
guaranteeing allies from attack. Here there  
are dilemmas and contradictions.**





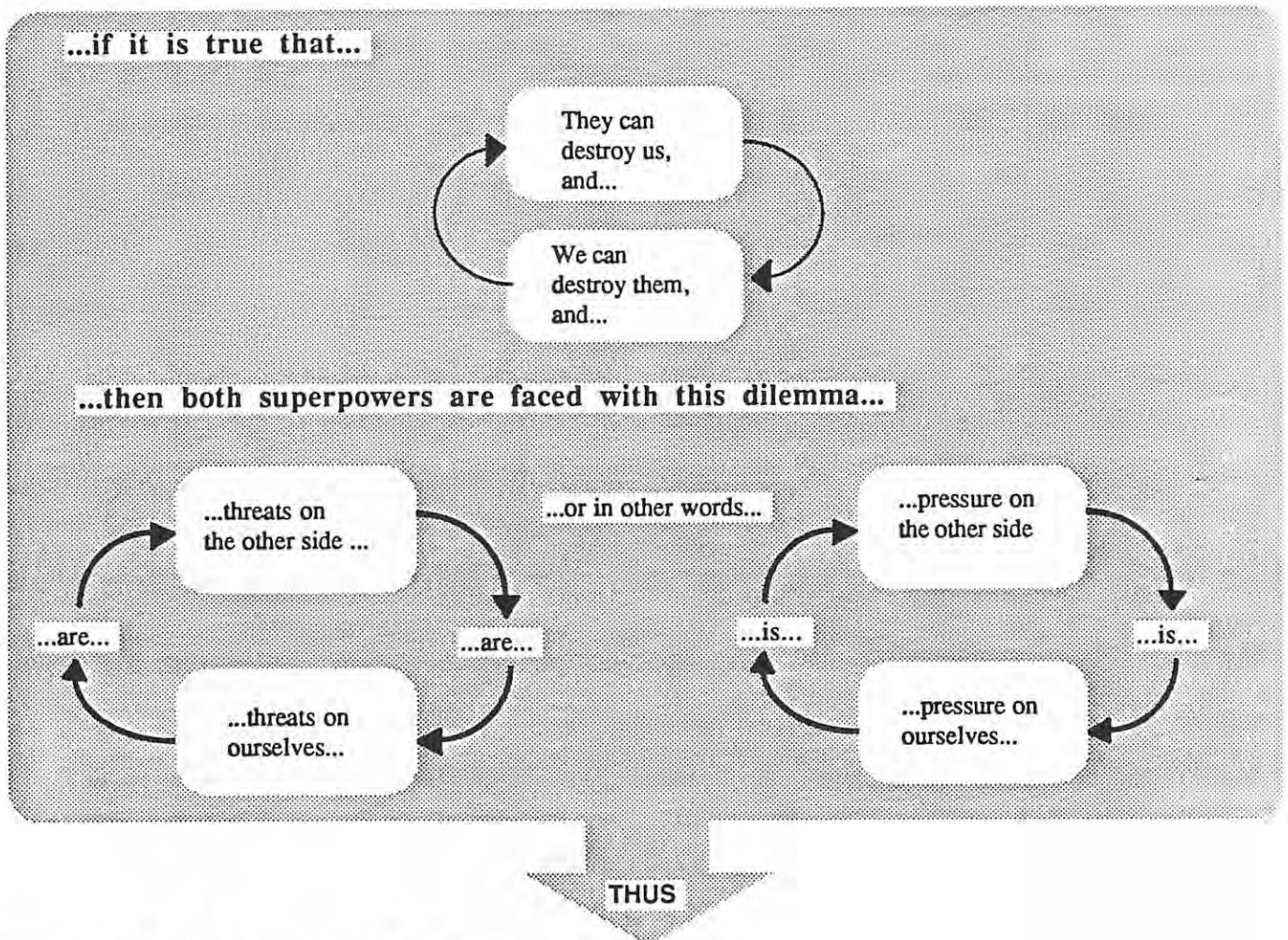
***They can threaten us with a war that we would start...***

The idea, expressed by some writers, that . . . a country cannot plausibly threaten to engage in a general war over anything but a mortal assault on itself inless it has an appreciable capacity to blunt the other side's attack, seems to depend on the clean-cut notion that war results--or is expected to result--only from a deliberate yes-no decision. But if war tends to result from a process, a dynamic process in which both sides get more and more deeply involved, more and more expectant, more and more concerned not to be a slow second in case the war starts, it is not a "credible first strike" that one threatens, but just plain war. The Soviet Union can indeed threaten us with war: they can even threaten us with a war that we eventually start, by threatening to get involved with us in a process that blows up into war.

Thomas Schelling  
nuclear strategist  
Professor of Government, Harvard University

# Can nuclear threats help superpowers decrease local aggression & conventional wars?

The major difficulty with a strategy that requires using nuclear threats to control local aggression or conventional wars is...



This reduces the believability of statements such as...

...we require a nuclear capability that has an implementable threat...

Defense Secretary James Schlesinger (1974)

...we must make sure that the Soviet leadership, in calculating the risks of aggression, recognizes that an effective American response exists...

Defense Secretary Caspar Weinberger (1984)

Implementable threats are difficult to make credible

...but...

...only a little credibility is required...

Robert Jervis (1984)

## *Tactical Nuclear Weapons*

Distinguishing between "strategic" and "tactical" nuclear weapons is as tricky as differentiating in medieval theology between efficacious grace and sufficient grace. You might imagine that "tactical" nuclear weapons are all modest little battlefield bombs for strikes against tanks and airfield, but that is not the case . . .

Alternatively it might be supposed that the "tactical" bombs are for use against military targets only; wrong again, they can be used equally well against cities. Some writers prefer to call them "theater" nuclear weapons, meaning that they are stationed in regions away from the homelands of the superpowers. . . this is closer to the mark, although not as sharp as the cynic's version: "A tactical nuclear weapon is one

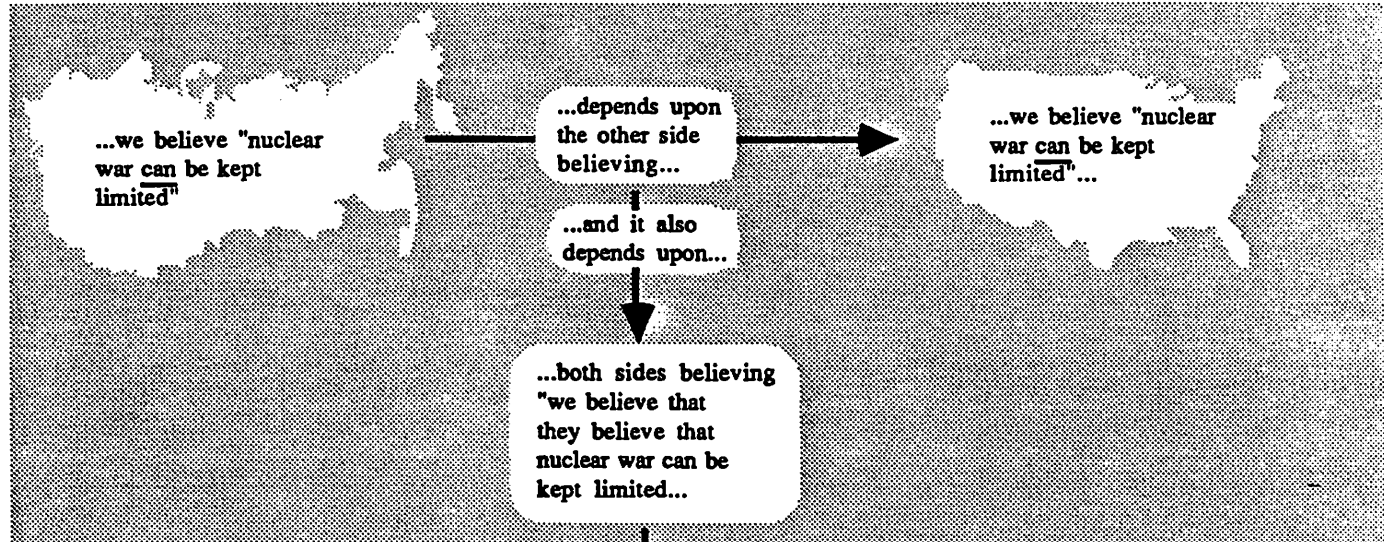
Nigel Calder



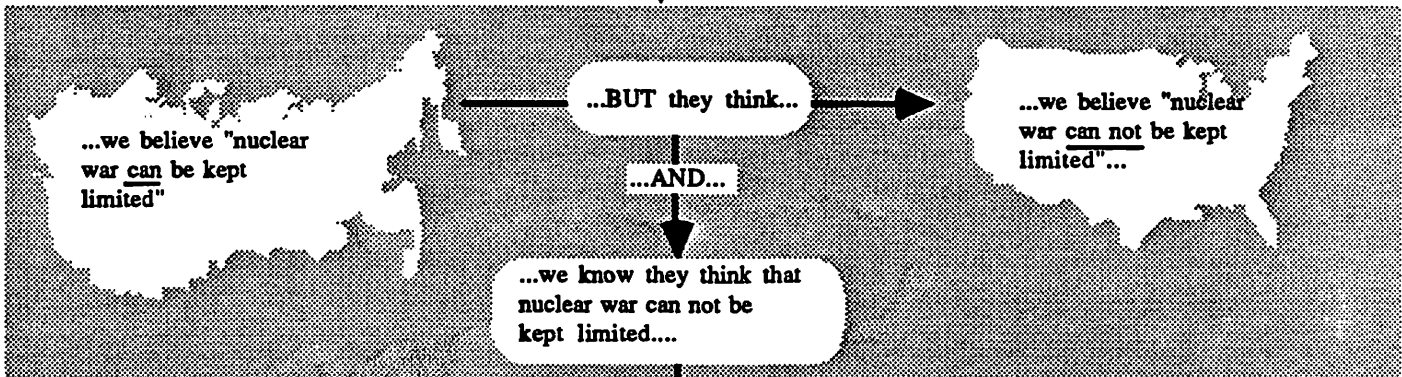


# Why don't we just say that nuclear war must never be total, but must be kept limited?

Some have argued that we can keep a nuclear war limited by declaring that we will respond only in a limited fashion (e.g. we will retaliate only to the extent we are attacked).



...because IF the following is true...



...THEREFORE...

...it doesn't matter if we think nuclear war can be kept limited. What they believe will determine what would happen...

This has sometimes been called...

The

...what they think...

...determines...

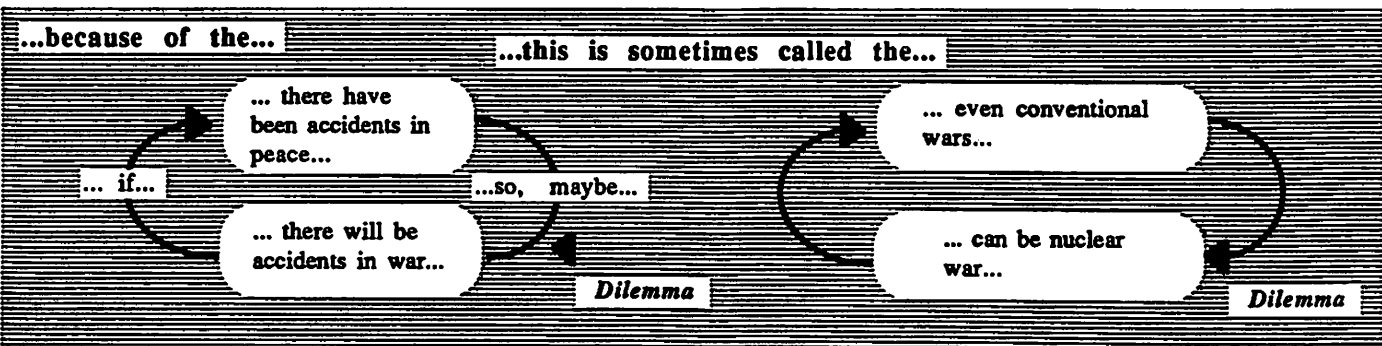
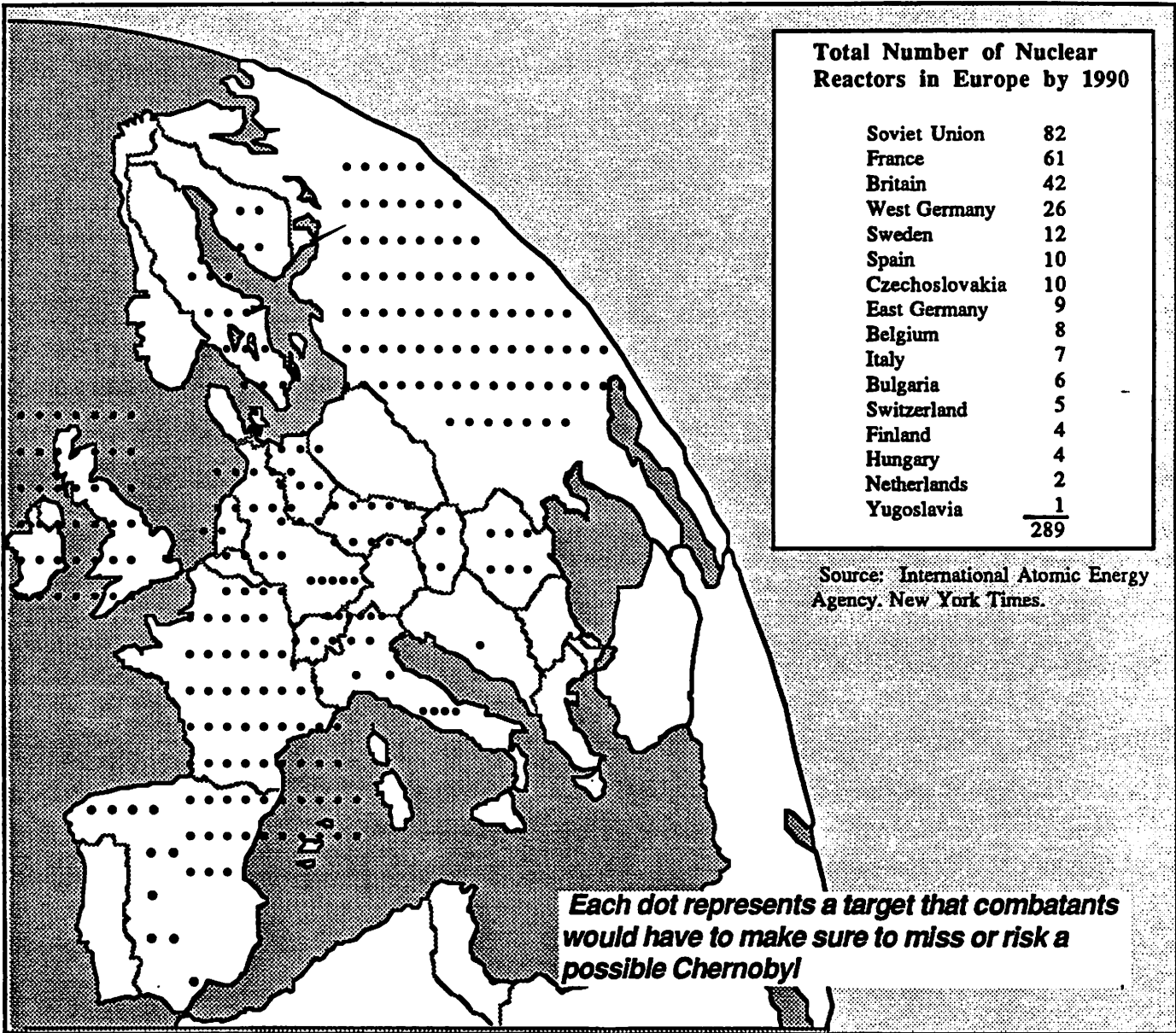
...what we think...

...determines...

Contradiction

# What would happen to existing nuclear power reactors during a conventional war?

The accident at the Chernobyl nuclear plant showed leaders all over the world the dangers of damage to a nuclear power reactor. Each reactor in the world is a potential Chernobyl in a war fought with conventional arms.



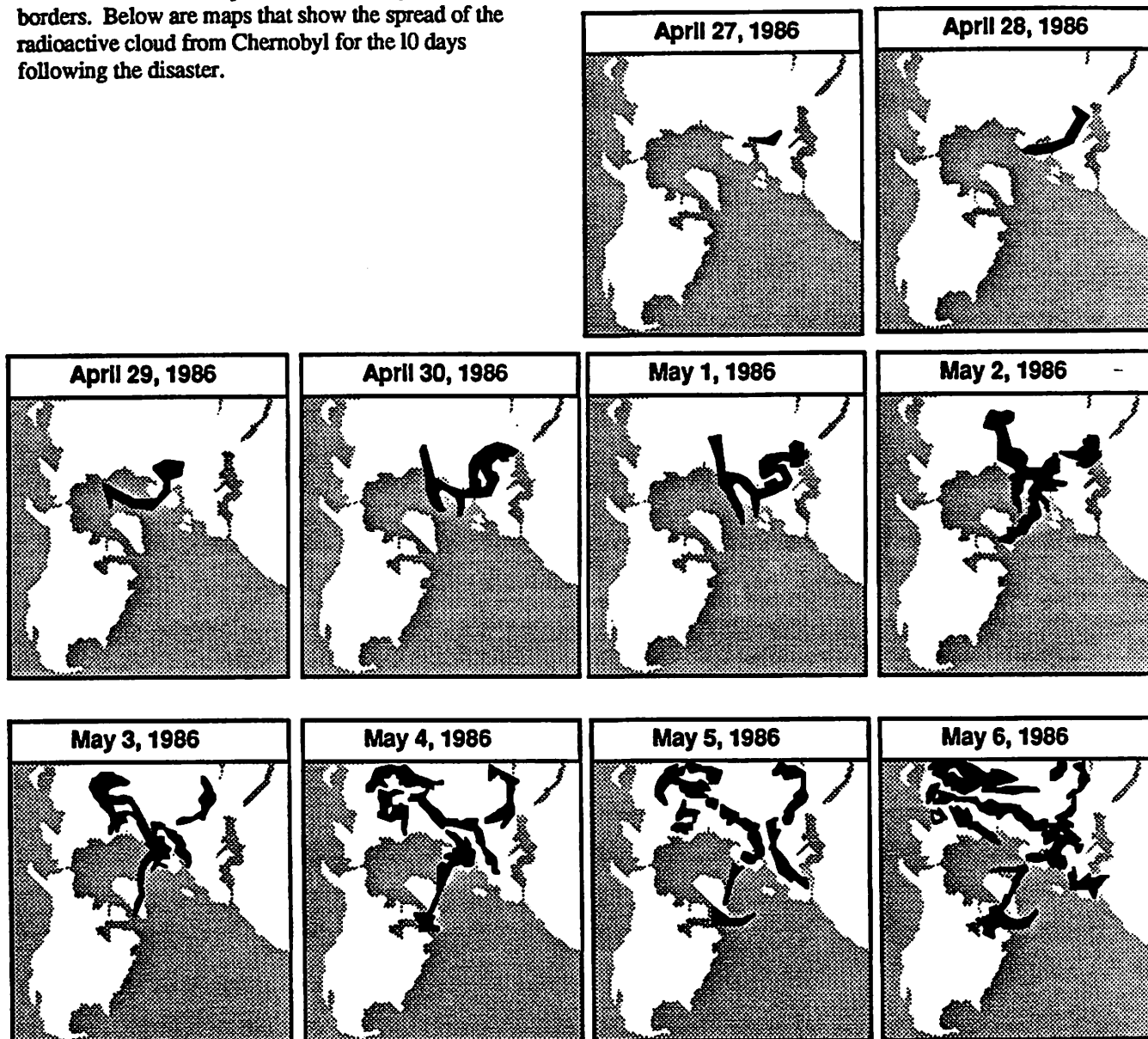
### ***Limited. Nuclear War***

My own view remains that a full-scale thermonuclear exchange would constitute an unprecedented disaster for the Soviet Union and for the United States. And I am not at all persuaded that what started as a demonstration, to even a tightly controlled use of the strategic forces for larger purposes could be kept from escalating to full-scale thermonuclear exchange.

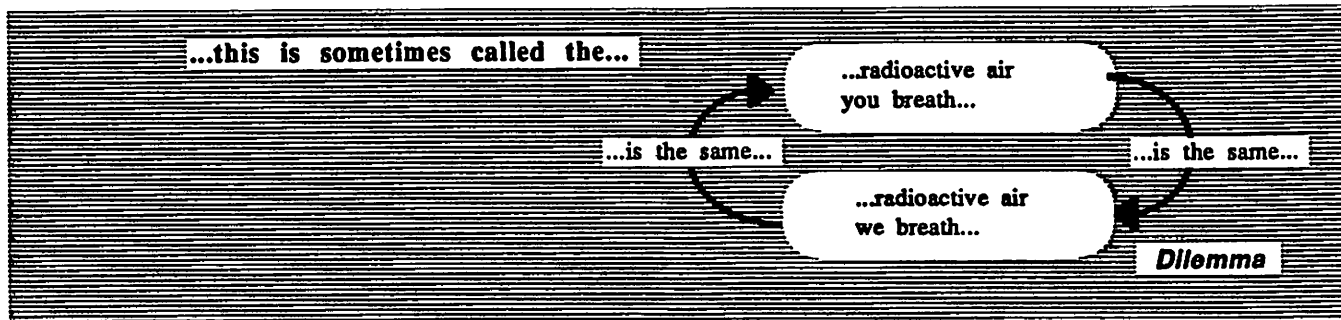
Harold Brown

# Wouldn't we hurt ourselves almost as much as we damage the other side in even a limited nuclear war?

The people of all countries learned from the accident at the Chernobyl nuclear plant that radioactivity released into the atmosphere does not stop at national borders. Below are maps that show the spread of the radioactive cloud from Chernobyl for the 10 days following the disaster.



Data: Lawrence Livermore Laboratory Simulations. Map Redrawn from N.Y.Times



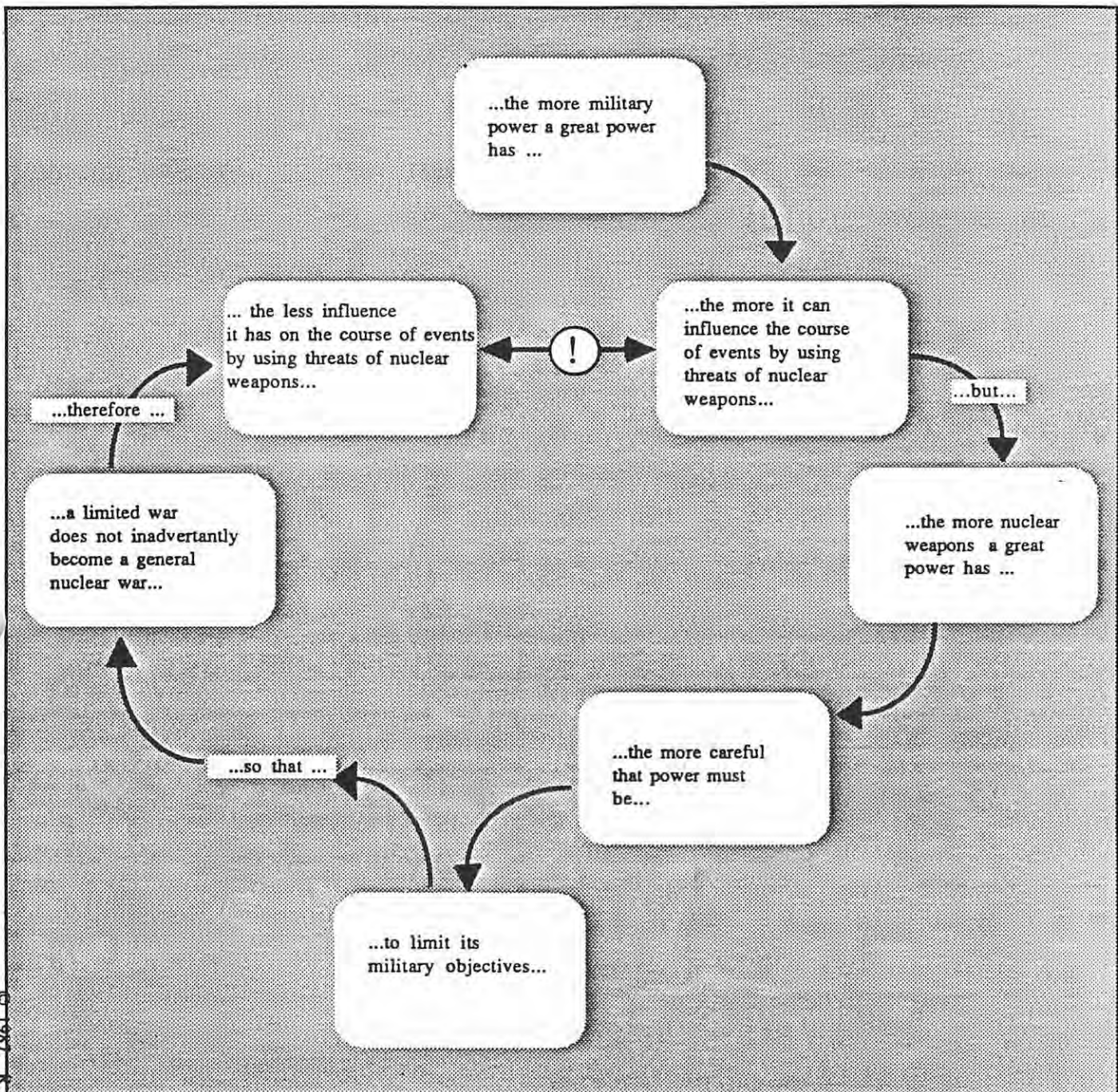


*Perceptions of Tactical Nuclear Defense...*

Nonetheless, the price the United States and its allies would pay for the benefits of a world of strategic (and medium-range theater) defense dominance, would not be a light one. International order, to a degree unprecedented since the end of World War II, would depend most heavily on perceptions, particularly on Soviet perceptions, of the putative defensive prowess of Western conventional and battlefield nuclear weapons.

Colin S. Gray  
author of *Arms Control and European Security*  
*The Nuclear Strategy and National Style*

# Why is it harder to find a use for nuclear weapons in limited conflicts, the more of them you have?



...this paradox is sometimes called...

The

...more nuclear weapons you have...

...the less you can use them ...

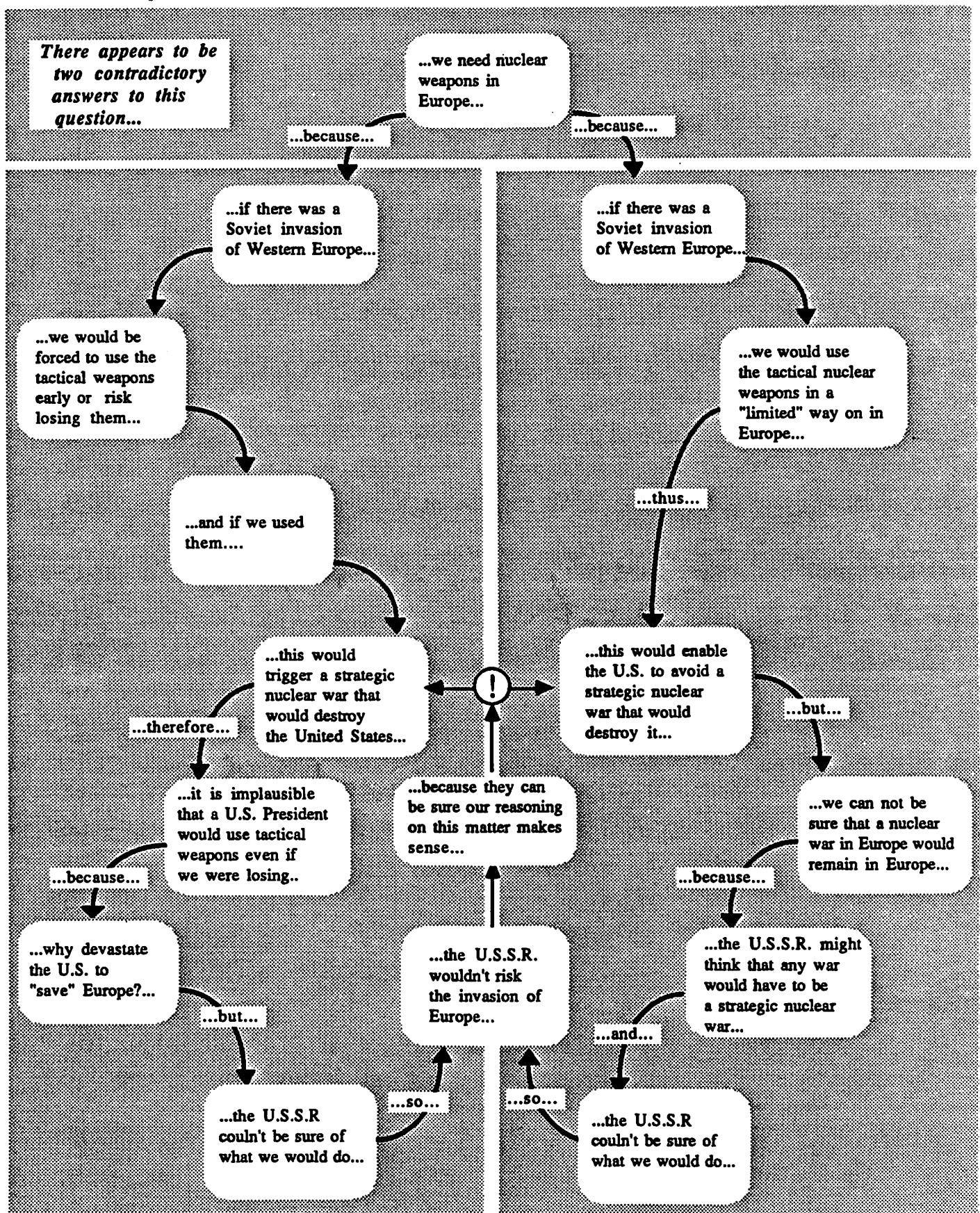
Paradox

### *The Benign Aspect of Confusion...*

Clarifying U.S. doctrine might also undermine the "uncertainty" component of deterrence. There is a historic tension in U.S. strategy between acceptance of mutual nuclear deterrence and commitment to first use of nuclear weapons to stave off defeat in a European war. Most analysts believe that the second lacks credibility on rational grounds but retains some credibility as long as the Soviets cannot be certain that U.S. leaders accept such a conclusion. Detailed, frank discussions might erode the benign aspect of confusion that underwrites such uncertainty.

Richard K. Betts  
Senior Fellow, The Brookings Institution  
author of *Surprise Attack*  
and *Soldiers, Statesmen, and Cold War Crises*

# What is the purpose of "tactical" nuclear weapons in Europe?



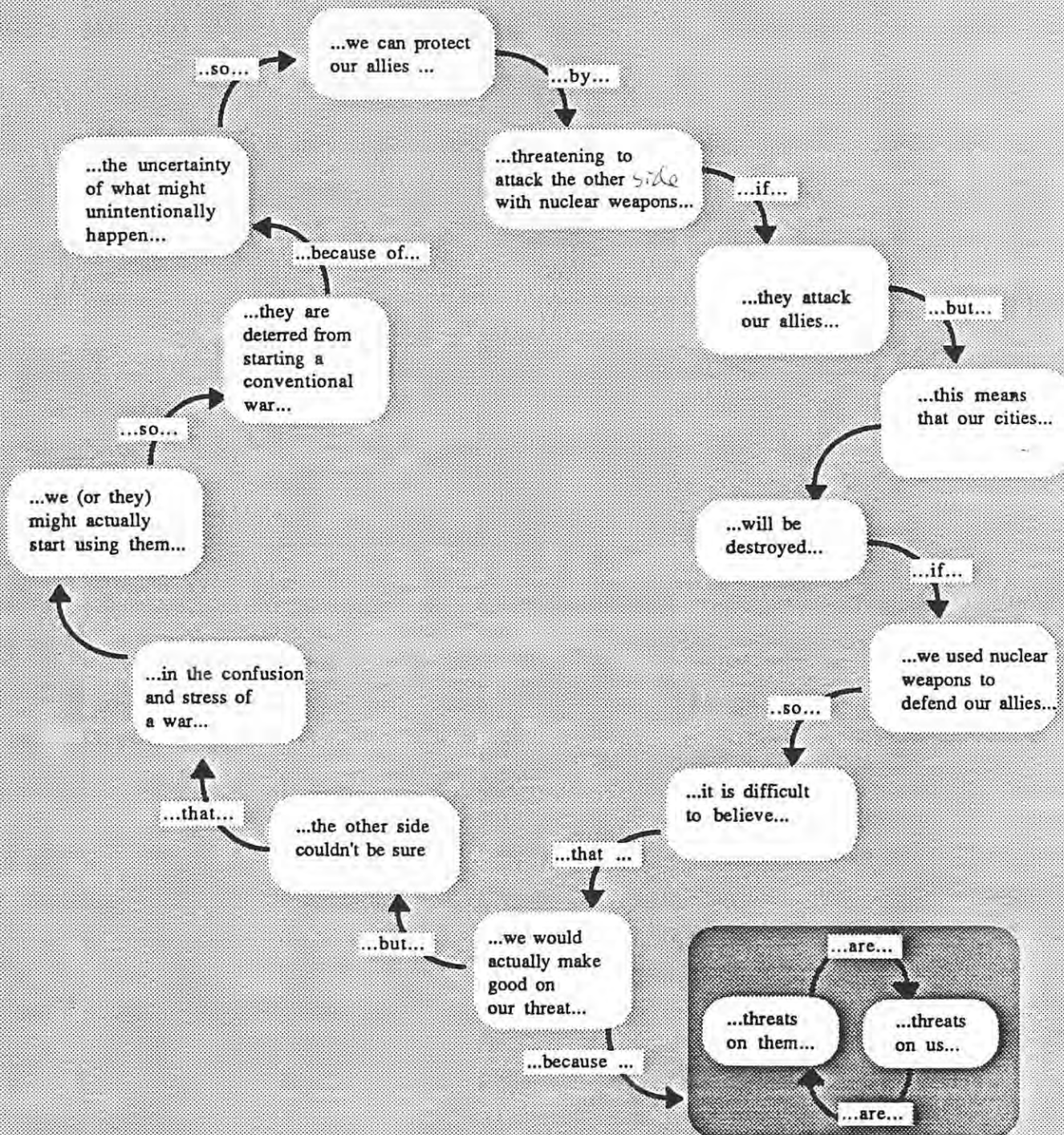


*We may deter ourselves...*

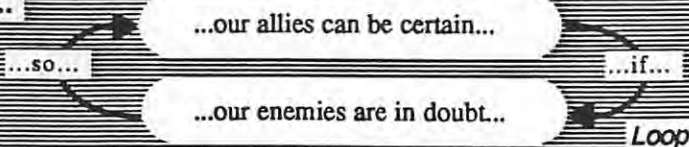
It is one thing to deter an enemy from initiating a nuclear attack; it is quite another to avoid self-deterrence if the burden of nuclear escalation is on your shoulders. That is the essence of the United States deterrence problem; it flows from the geography of East-West conflict and the character of Western European societies that decline to provide a truly robust, local nonnuclear defense effort.

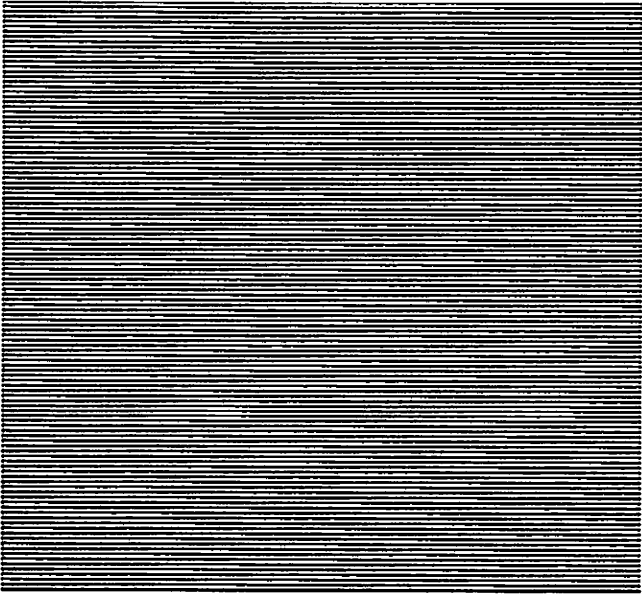
Colin S. Gray  
author of *Arms Control and European Security*  
and *The Nuclear Strategy and National Style*

# Can we protect our allies with our nuclear weapons?



This is sometimes known as the...



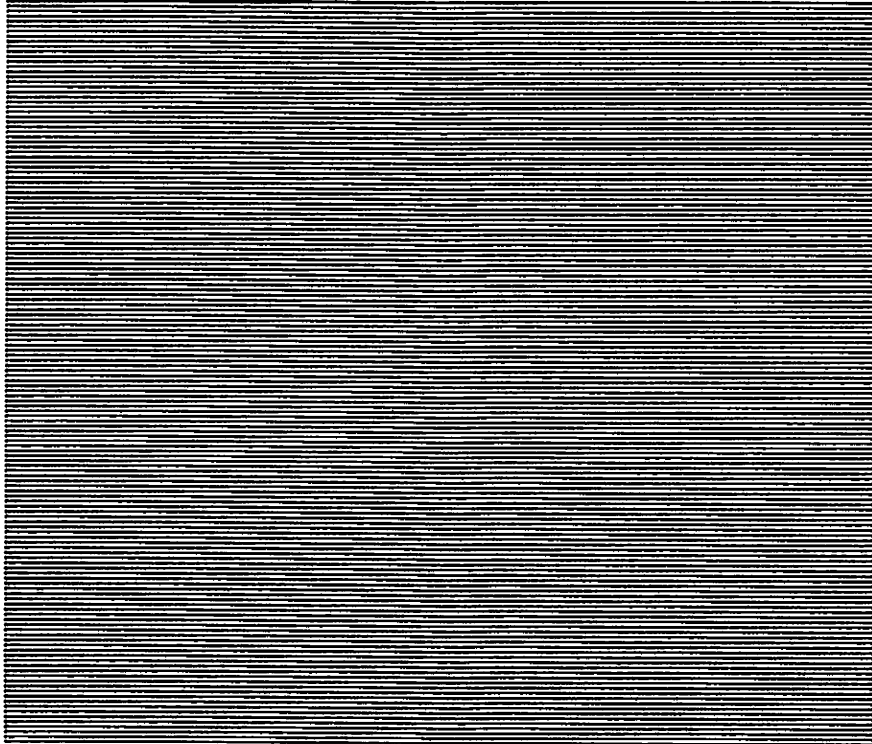


*The primary concern of perception theory is a question as old as the nuclear arms race itself: "Who's ahead?" Perception theorists readily agree that in a real military sense--in the event of war--such comparisons are not important, given greatly redundant arsenals. They do not contest the fact of overkill. But they insist that such comparisons have political and psychological consequences that outweigh military consideration. The perception of U.S. strategic inferiority by Soviet or other world leaders or even by the American public, they contend, might lead to developments that would weaken American security...Some American leaders and strategists fear that the Soviets might be entertaining the illusion that nuclear war, like conventional war, can be limited and even meaningfully won.... Perception theory proposes playing along with the illusion by recommending that the United States try, through its weapons procurements and by devising war-fighting strategies, to create the perception that it, too, believes that a nuclear war can be limited and even meaningfully won....The most questionable aspects of perception theory, however, is its proposal that, in order to create false impressions, the United State should play along with the illusion by building militarily unnecessary weapons according to mistaken parameters. The theory even proposes actively promoting the illusion at times--a course of action wrought with ironic contradictions.*

Steven Kull



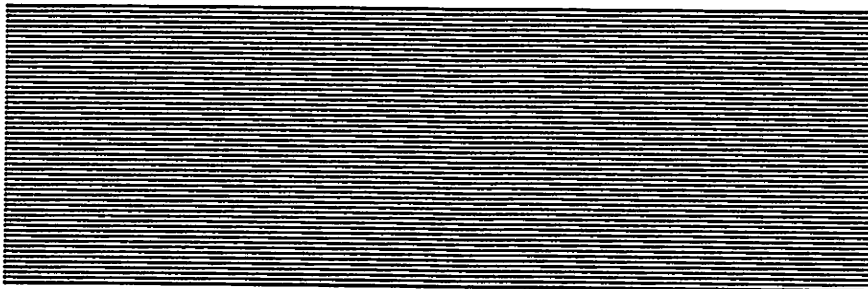
OK



## Chapter 9

# Perceptions of Deterrence

**Some of the arguments about deterrence arise out of what the other side perceives. This chapter explores the reasoning about these perceptions**





### *The Perception of Superiority*

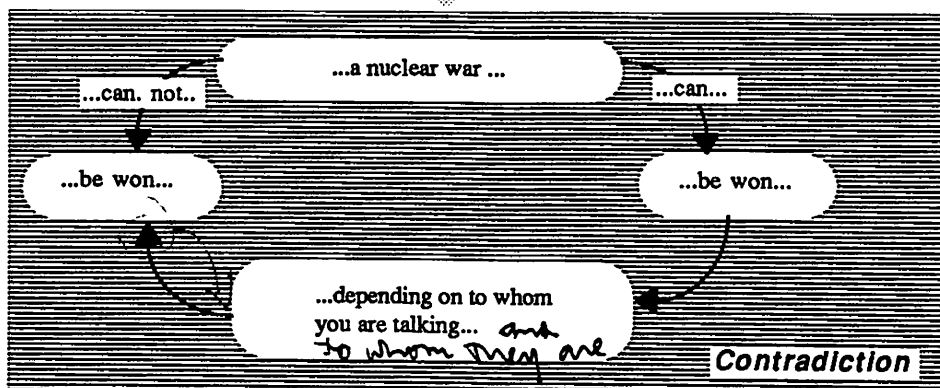
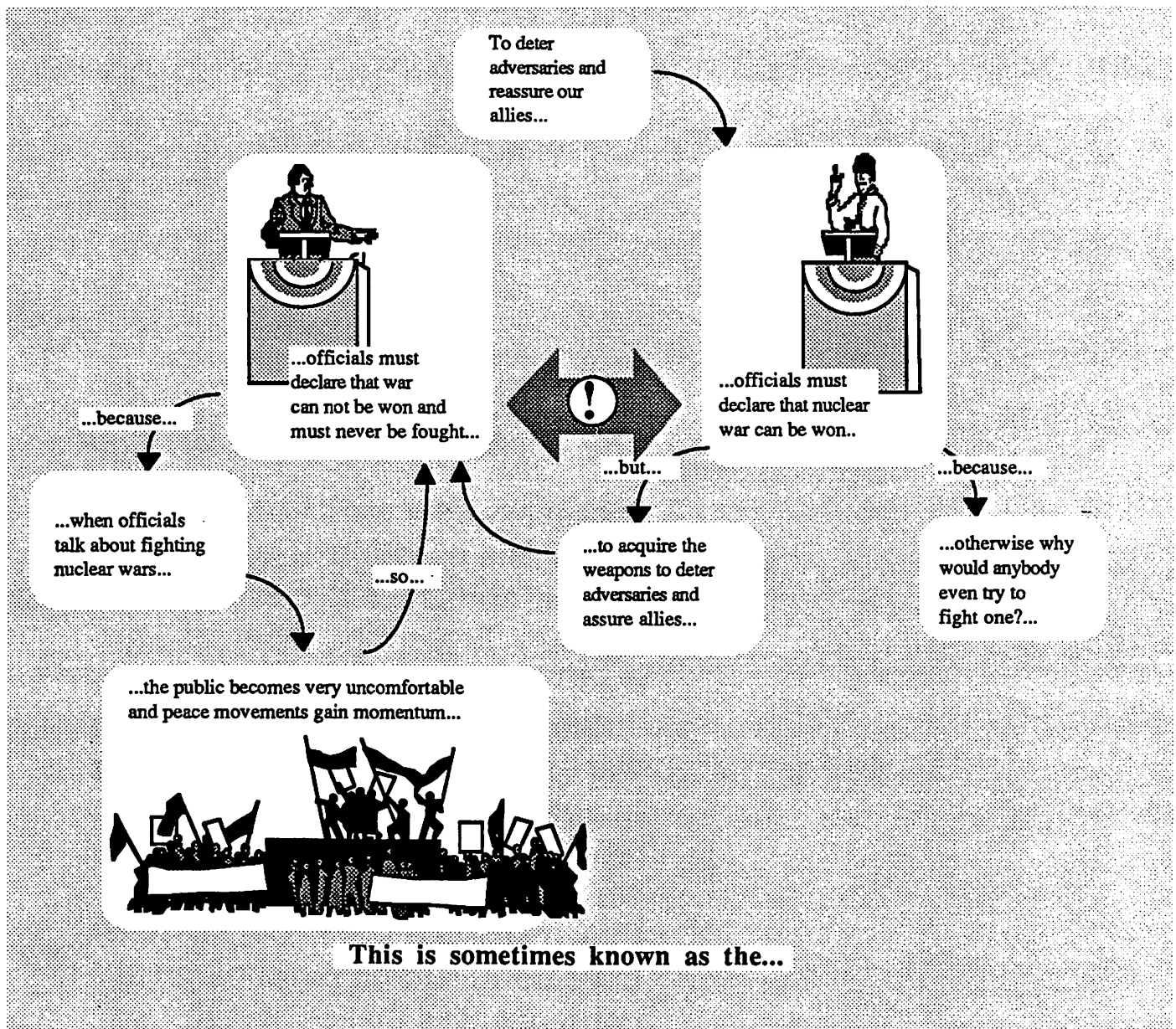
The Presidents of the nuclear age have recognized that the law of diminishing returns applies to strategic missiles . . . . But they have all rejected the gamble of limiting our strategic strength in terms of any absolute concept of what is enough. They have measured our strength against that of the Soviet Union and have aimed at strategic superiority; that superiority has had different stages, but seen from the White House its value for peace has never been small

McGeorge Bundy  
former National Security  
Advisor to President Kennedy  
1964

The heavy rhetorical emphasis on continuing American superiority was misleading. . . . What we did not say so loud was that the principal use of this numerical superiority was in its value as reassurance to the American public and as a means of warding off demands for still larger forces.

McGeorge Bundy 1979

# Why do we hear both that nuclear war can be won and that it can not be won?



OK

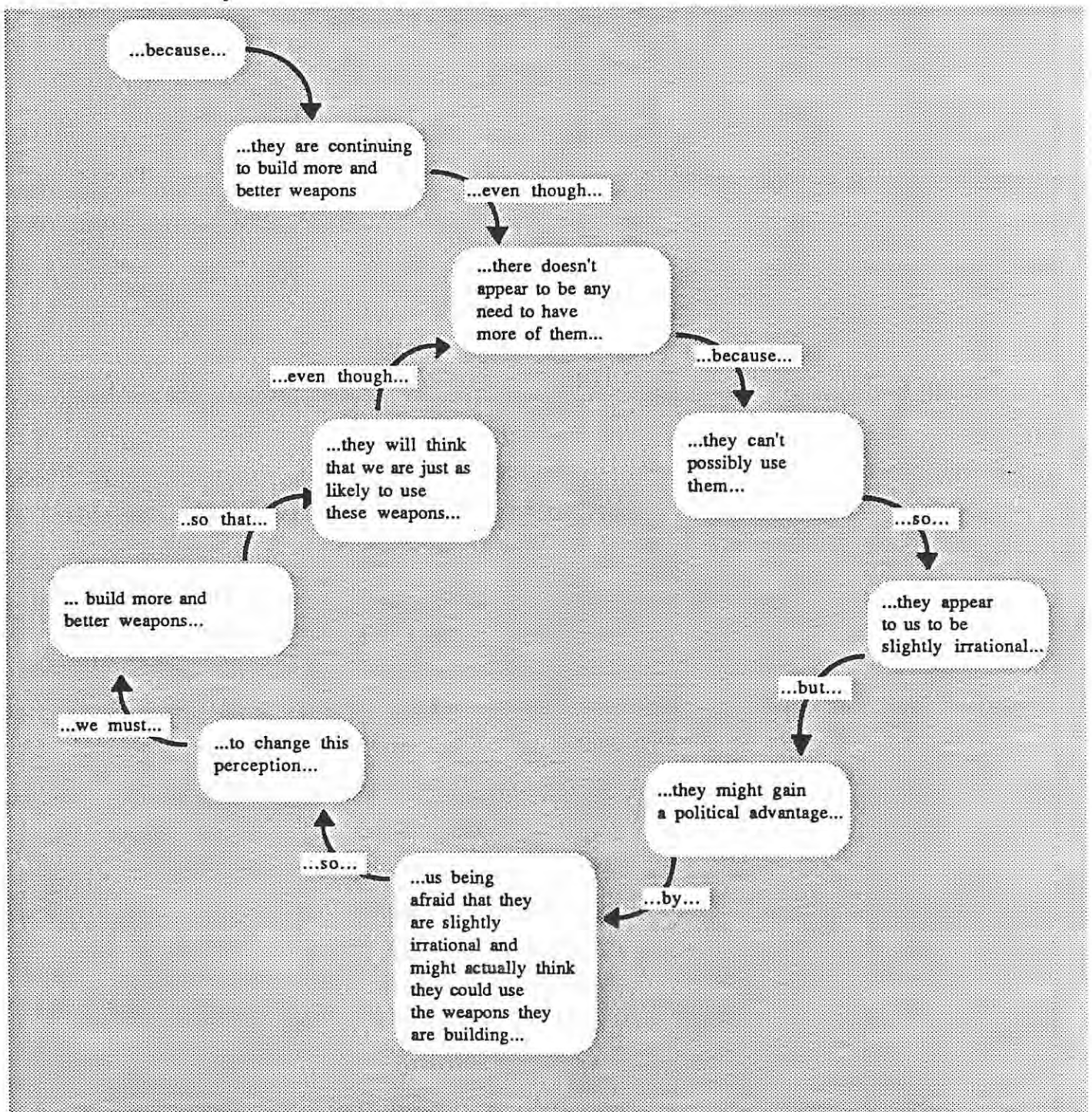
talking

### ***The "Who's Ahead" Perception***

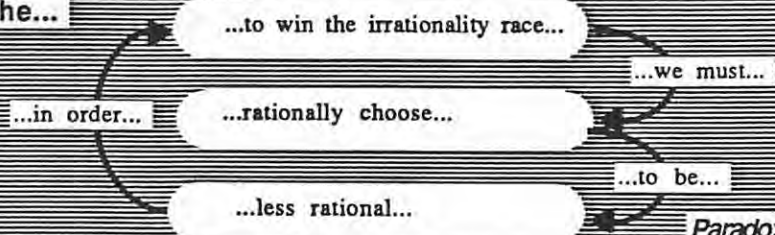
A primary concern of perception theory is a question as old as the nuclear arms race itself: "Who's ahead?" Perception theorists readily agree that in a real military sense--in the event of war--such comparisons are not important, given greatly redundant arsenals. They do not contest the fact of overkill. But they insist that such comparisons have political and psychological consequences that outweigh military considerations. The perception of U.S. strategic inferiority by Soviet or other world leaders or even by the American public, they contend, might lead to developments that would weaken American security.

Steven Kull  
political psychologist  
Stanford University

# Does the perception of why we should build more weapons make a difference?



This is sometimes known as the...



Paradox

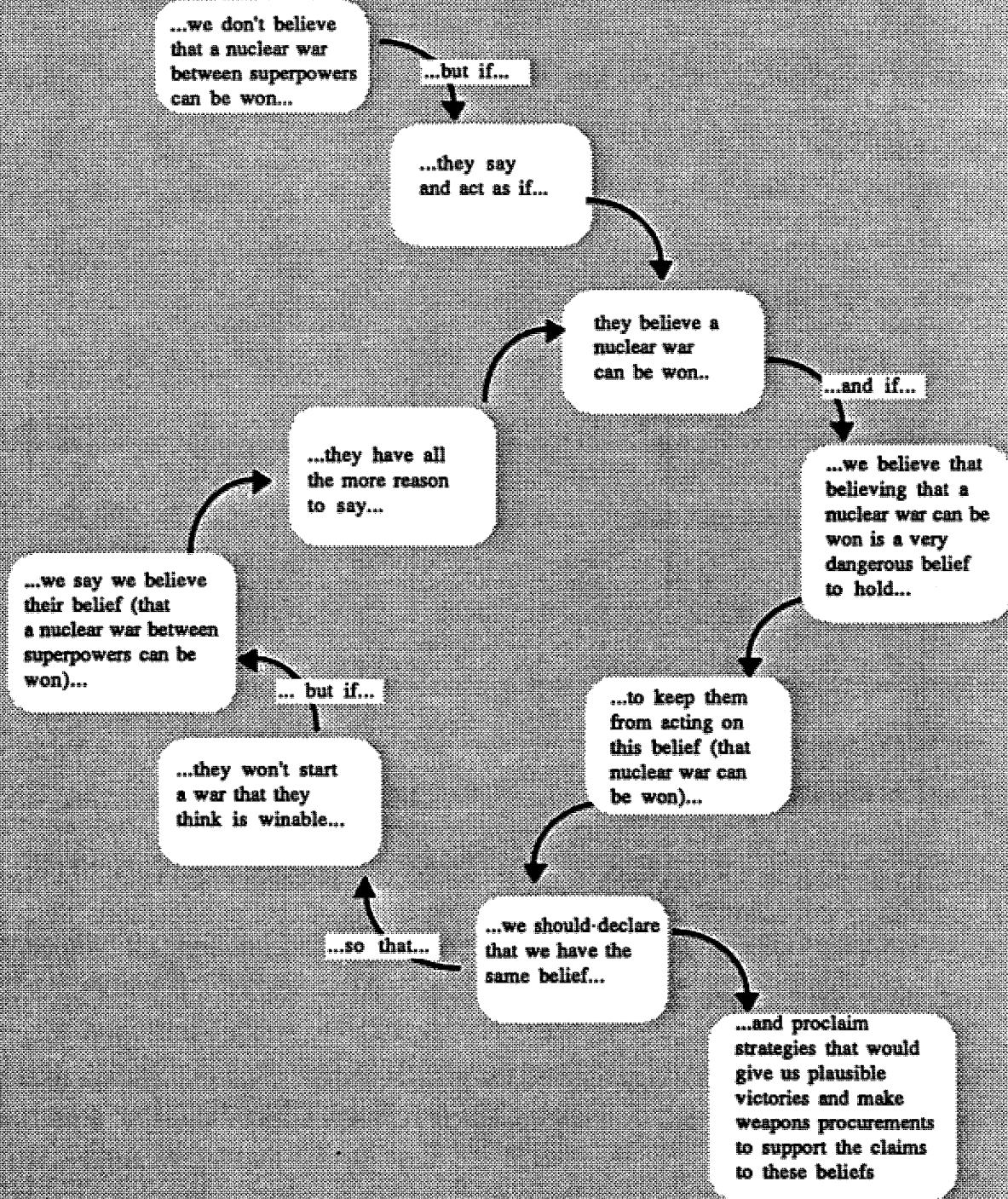


### *The Illusion of Meaningful Action*

Psychologists have found that when people face a threat to which they cannot effectively respond, they tend to generate the illusion that there is some meaningful action they can take to reduce the threat. This can lead to certain kinds of irrational thinking in which they believe the threat to be counteracted by actions that do not reduce the threat or that sometimes even exacerbate it. At times, a vague rationality spurs these actions--for example, repeating an action that at one time did, or in other circumstances would, actually reduce the threat.

Steven Kull  
political psychologist  
Stanford University

# Why do both sides sometimes say a nuclear war can be won?

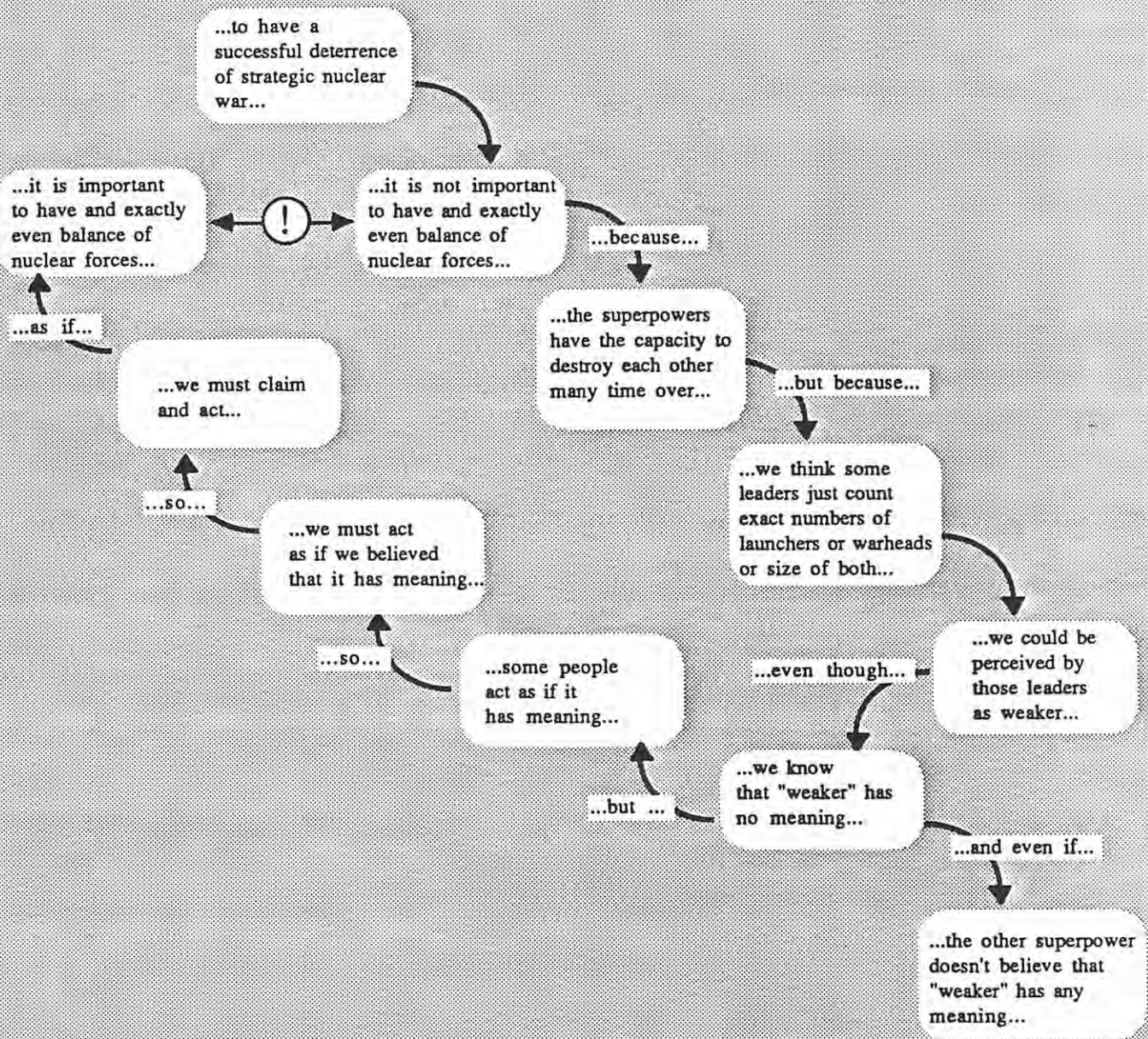


***Scaring Your Own People Does  
Not Make a Strategy Popular...***

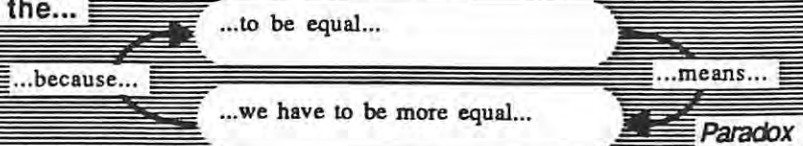
As the war fighters discovered, scaring own people and those of your allies is a way to enshrine your strategic vision. Increases in defense spending, and especially the deployment of offensive nuclear systems must be linked to some vision other than waging nuclear war. As the finite deterrence theorists discovered, the threats of mass murder and nuclear apocalypse are insufficient visions for sustaining national security policy.



# Do we need an exact balance of strategic nuclear forces?



This is sometimes known as the...





### *Threat*

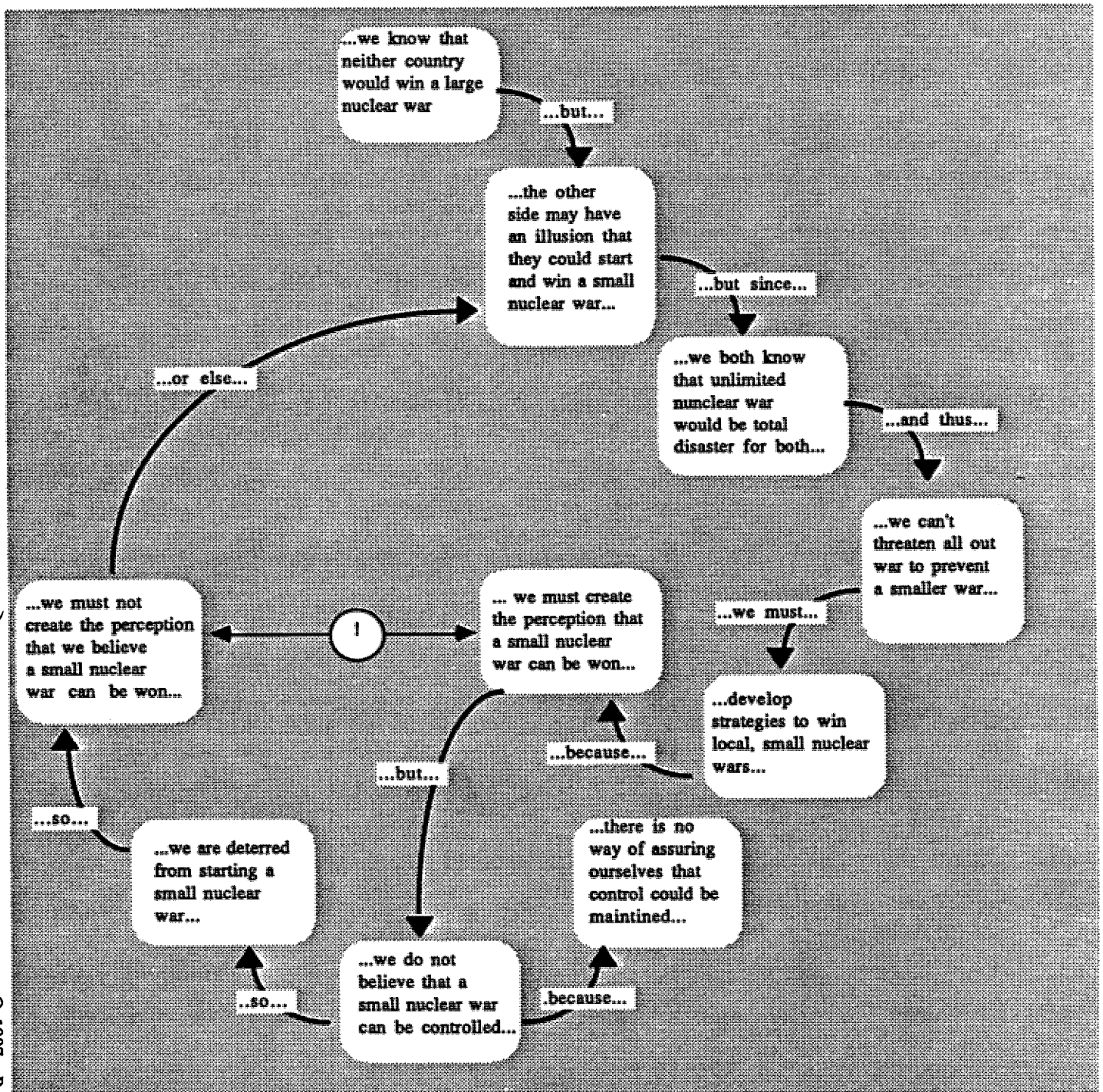
To be successful, a threat must meet these conditions:

1. It must be convincing or believable enough to be taken seriously.
2. It must reach its target (the threatened party).
3. The target must be capable of complying with it.

If any one of these ingredients is missing or can be eliminated, the threat will fail.

Paul Watzlawick  
psychologist,  
author of *What is Real?*

# Should we create the perception that a small nuclear war could be fought and won?



...this is sometimes called the...

...of the original  
perception...

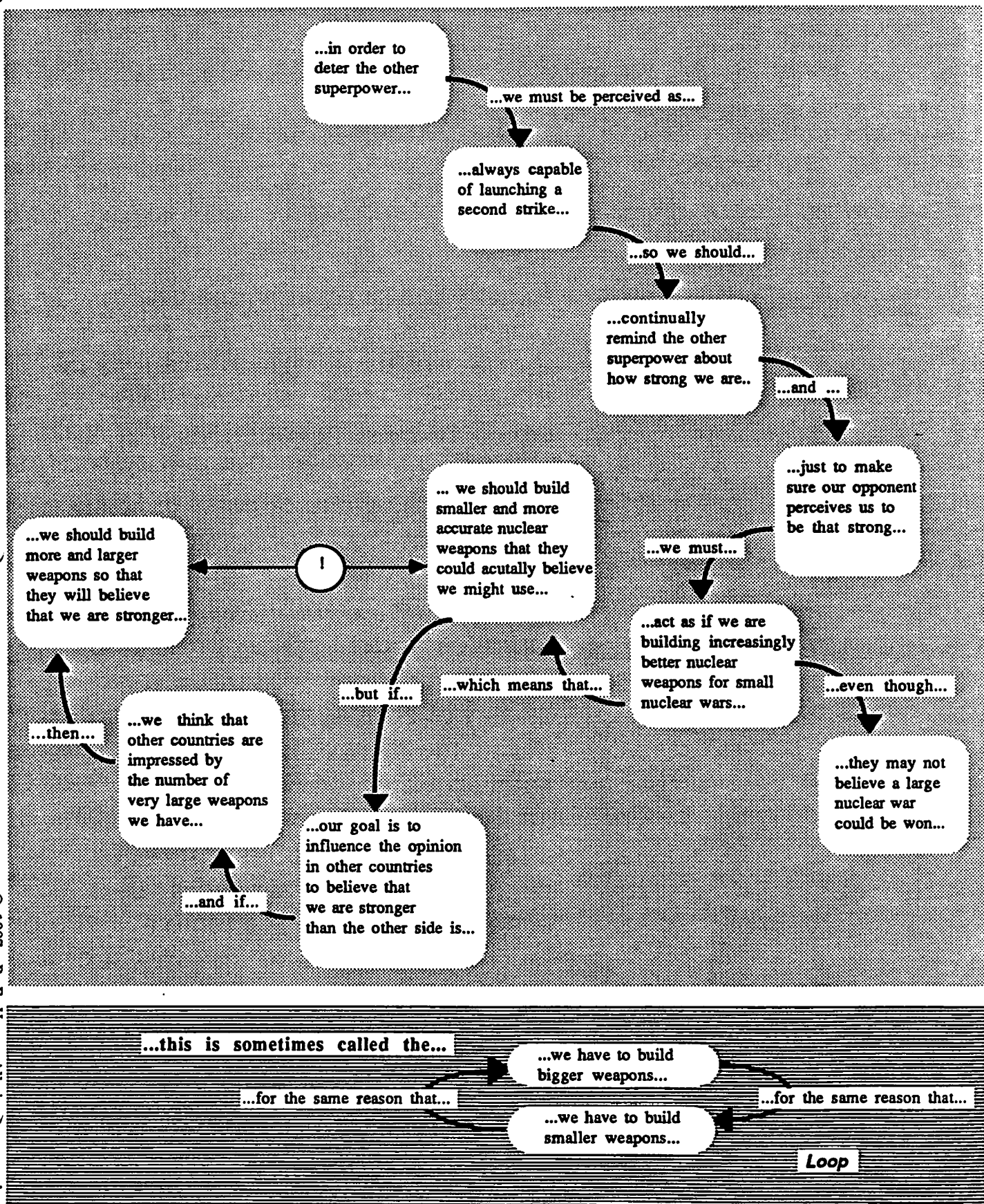
...we must create  
the perception...

...so that they will  
believe the perception...

...of the opposite  
of the perception...

**Perception**

# How do we get them to believe that we are stronger than they are?



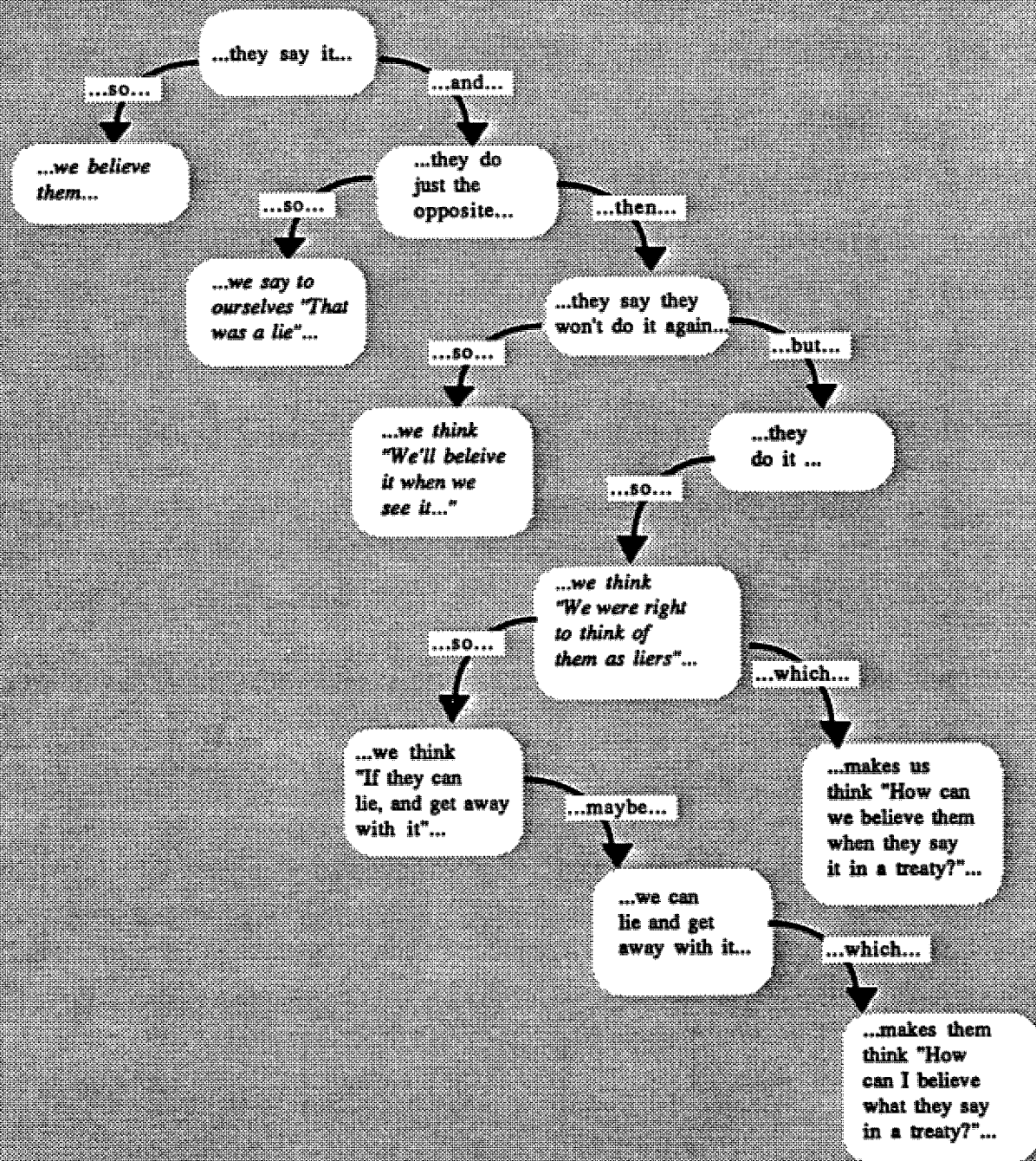
## *Trust*

Exactly the same dilemma has plagued disarmament talks, from the days of the League of Nations to the present. As one follows the course of these negotiations it becomes obvious that all nations agree on the goal: large-scale if not total disarmament. This goal can be reached only under conditions of mutual trust. But trust cannot be enforced or deliberately produced; indeed, it cannot even be defined as part of a treaty the way one can define the number of nuclear submarines or the details of an antiballistic weapons system. Thus a large part of these interminable negotiations seems wasted in an attempt to translate trust into a language that does not have a word for it. In the meantime, mankind is threatened with nuclear extinction, and the only sane alternative ... is impossible.

Paul Watzlawick  
psychologist  
author of *What is Real?*



# How does trust get built up in international relations?



...this is sometimes called the...

...the more we lie

.....so...

...the less they trust us...

...the less they trust us...

.....so...

...the more they lie...

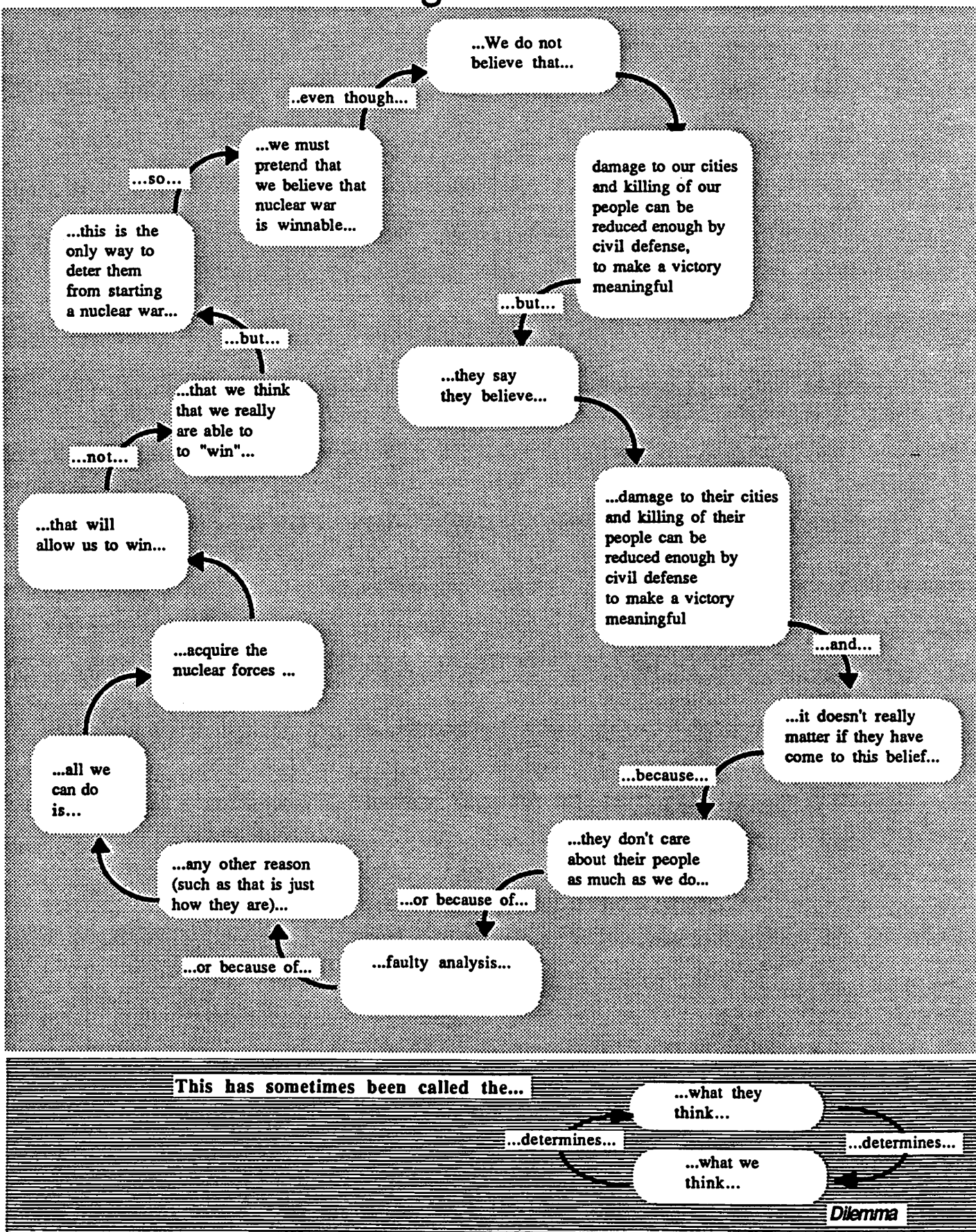
Loop

*How long can deterrence last?*

Can nuclear deterrence last forever? To answer yes requires heroic assumptions. Simple but powerful intuitions about human fallibility and skepticism about complex systems may account for the greater pessimism about deterrence on the part of the general public than on the part of nuclear strategists.

Joseph S. Nye, Jr.  
Professor of Government, Harvard University

# Why do we say that we think a nuclear war is winnable even though we don't think so?



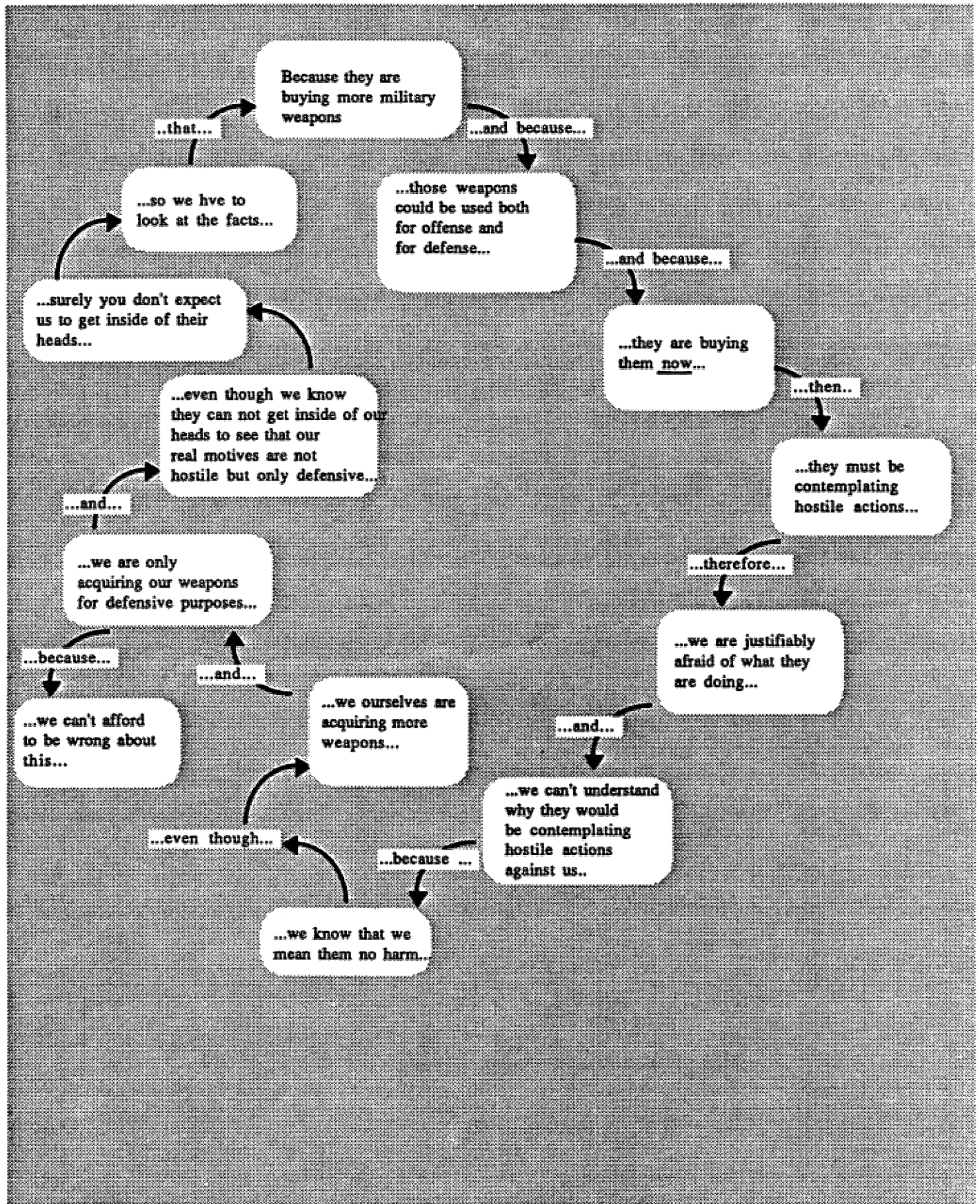
*They seem more aggressive precisely  
because they are acquiring more capability...*

... it is usually hard to draw inferences about a state's intentions from its military posture, decision makers in fact often draw such inferences when they are unwarranted. They frequently assume, partly for reasons to be discussed shortly, that the arms of others indicate aggressive intentions. So an increase in the other's military forces makes the state doubly insecure--first, because the other has an increased capability to do harm, and, second, because this behavior is taken to show that the other is not only a potential threat but is actively contemplating hostile actions.

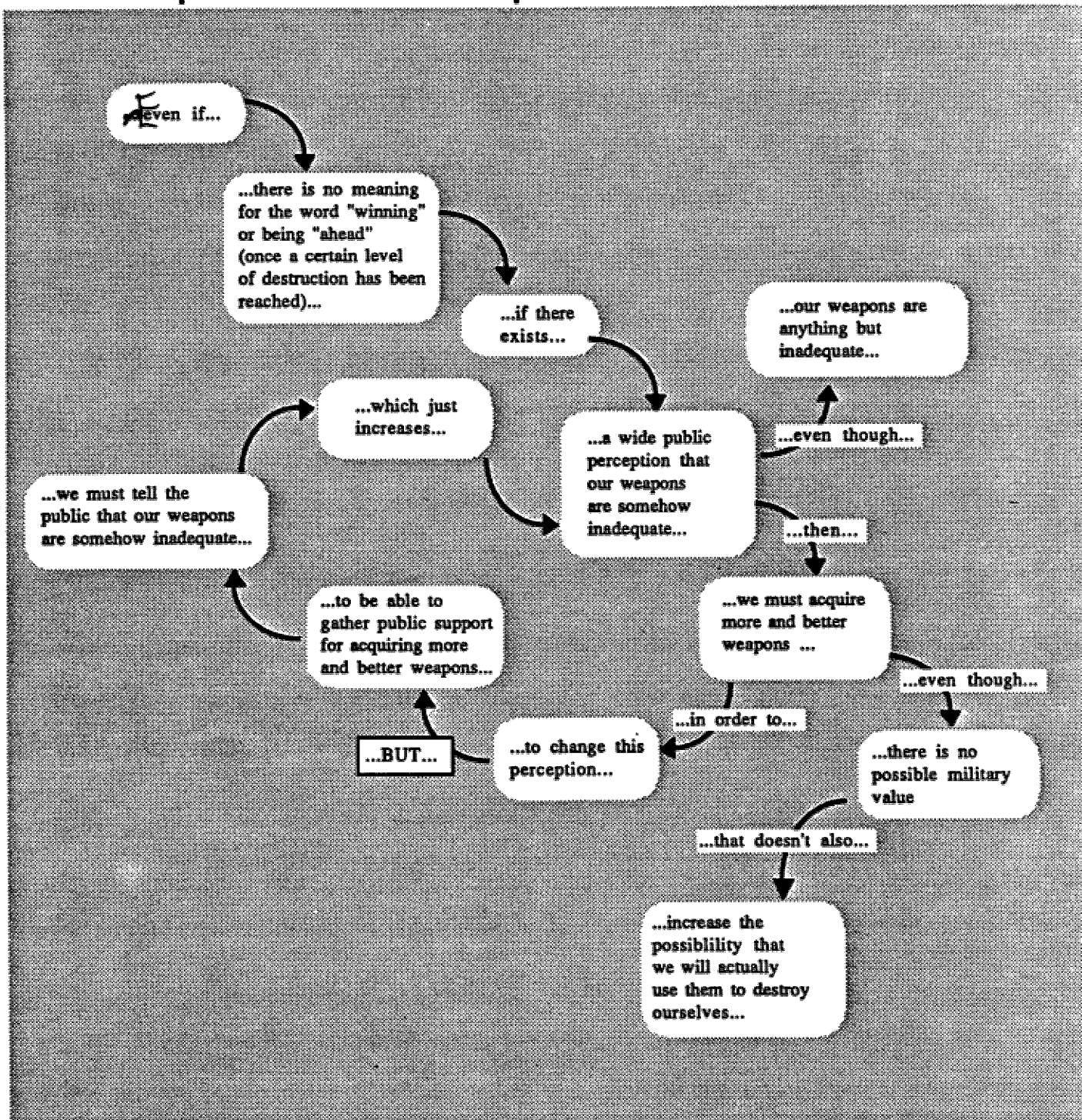
Robert Jervis  
Professor of Political Science  
Columbia University



# Why should they be able to see our motives are defensive if we can't see theirs are defensive?



# Why do we keep telling the public that our weapons are inadequate?



This is sometimes known as the...

...to...

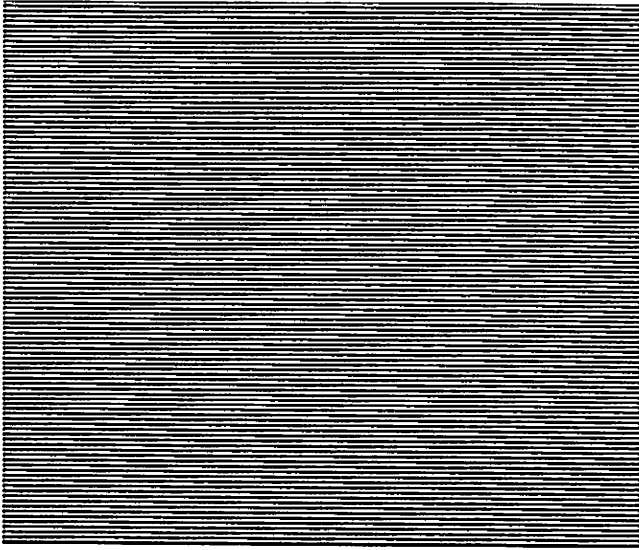
... fix the problem...

...which does not...

...make it worse...

...we have to...

**Paradox**



*...in the thermonuclear age military strategy begins to look like a game of chess without a chess board, that its mental construction and strategic anticipations are made in a world in which Kafka meets Lewis Carroll.*

Lawrence Freedman

*Nuclear strategy cannot be rational.*

Francois Sauzey

*If it is true that perceptions of the other's intentions are a crucial element of policymaking and that such perceptions are often incorrect, we need to explore how states perceive others and why and where they often go wrong. Military analysts talk of the "fog of battle" --the severe limits on the ability of each side to tell what the other's army (and often what its own army) is doing. But more important is the "fog of foreign policymaking." It is terribly hard to tell what others are up to, to infer their predispositions, and to predict how they will behave. Because of the importance and difficulty of these tasks, decision makers do and must employ shortcuts to rationality, often without being aware of the way they are doing so. But these shortcuts often produce important kinds of systematic errors, many of which increase conflict.*

Robert Jervis  
Professor of Political Science  
Columbia University





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## Chapter 10

### Risks and Choices

**There are no easy choices in nuclear affairs.  
In every case we must cooperate and trust.  
Question of fears, risk, trust, cooperation and  
competition mingle. And not to choose is to  
chose...**

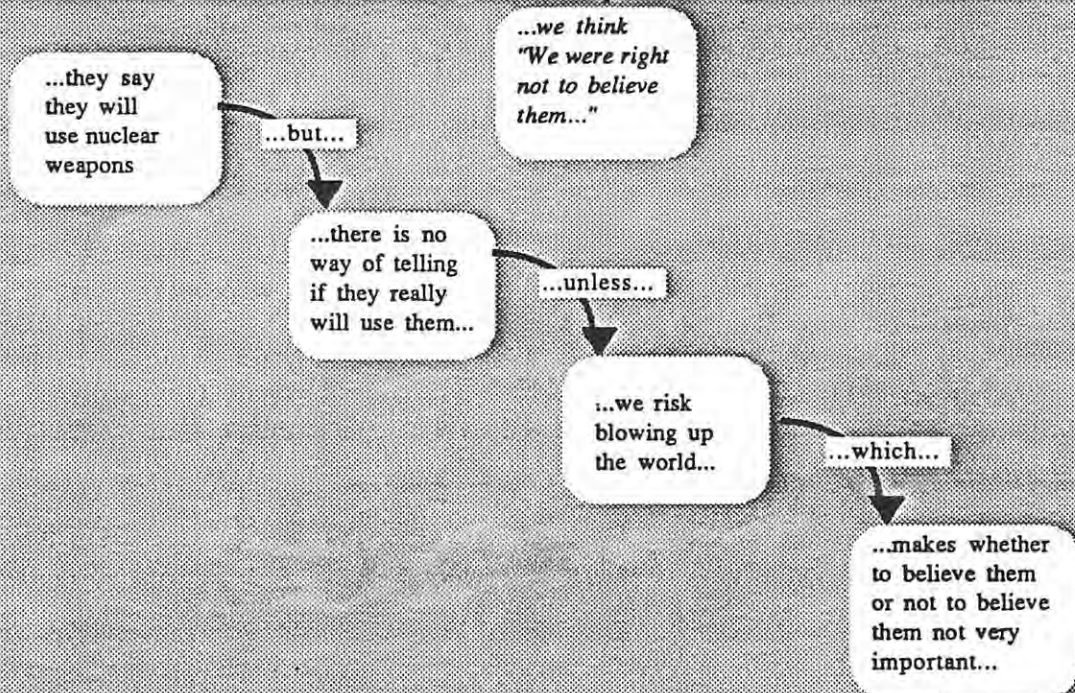
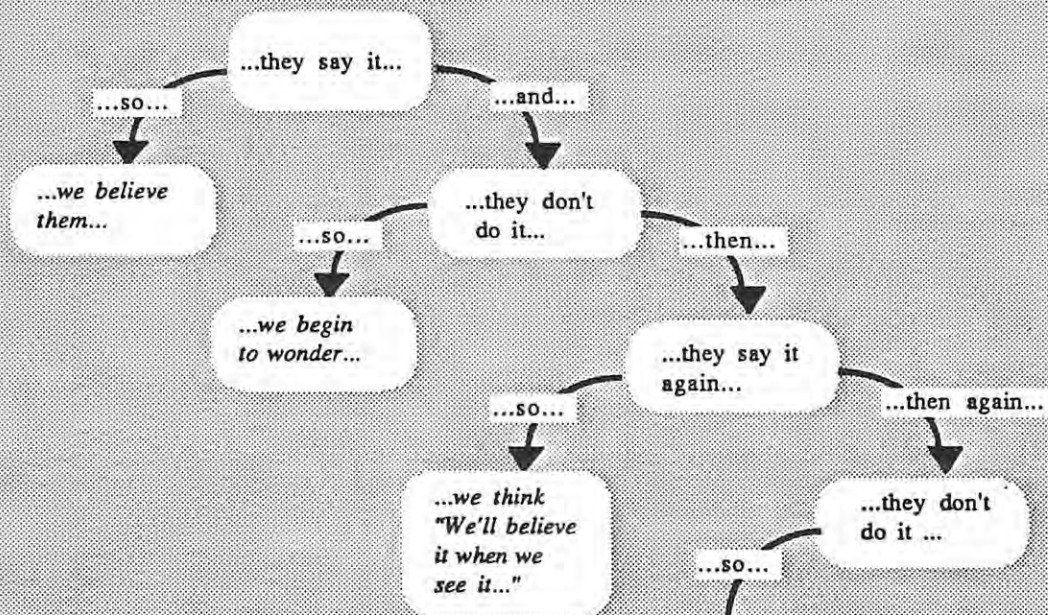


***Trust is unreasonable  
so we must do it***

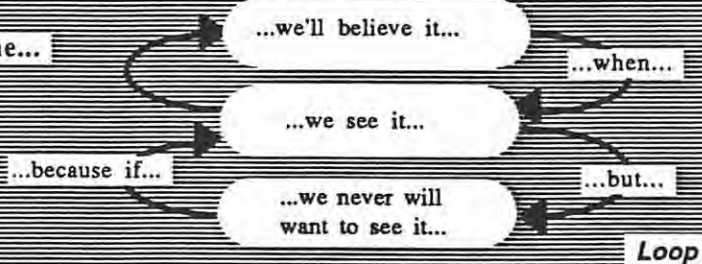
Is there any hope that nations will ever show that limited degree of trust which, at least occasionally, is displayed by individuals in comparable situations and enables them to escape the ultimately lethal trap of pure rationality? Nobody knows-but there is a ray of hope: in the course of the Nixon-Brezhnev talks in June 1974, the U.S. government made it clear that it had no intention of building the second antiballistic missile (ABM) ring to which it was entitled by the terms of the 1972 missile treaty. In the face of this unilateral decision, the Soviets seem to have felt it safe to forgo construction of their second ABM ring (behind the Ural Mountains)-a development which, with justification, was greeted as a historic breakthrough in relations between the two nations. This breakthrough became possible only after one side had unilaterally abandoned the language of pure rationality and taken a step in the belief that the other party would not take advantage of it. In other words, the United States exposed itself to all the risks that trust entails and which make it so "unreasonable."

Paul Watzlawick  
psychologist  
author of What is Real?

# How can we believe them when we don't believe them?



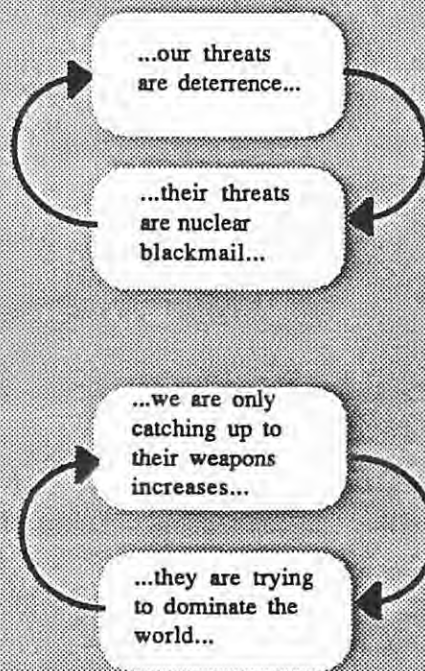
...this is sometimes called the...





# Why can't you be more definite about "our side" and "their side" in this book?

In this book I have tried to show how many of the arguments and dilemmas about nuclear strategy appear to apply equally and symmetrically to both sides.



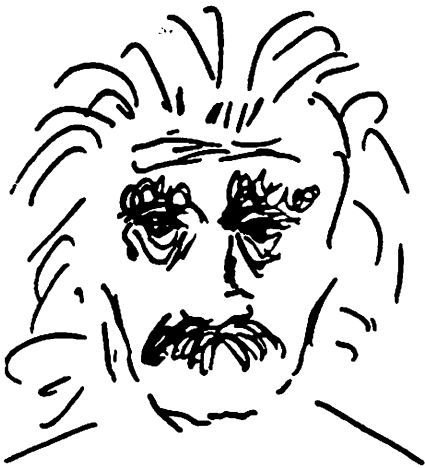
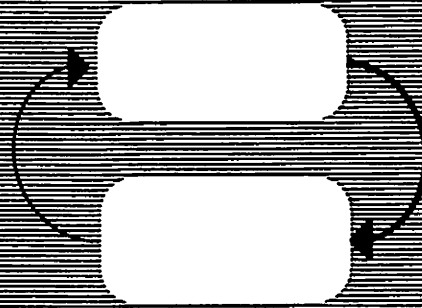
...this is sometimes called the...

...who is "them"

...who is "us"

**Dilemma**

Is this what Einstein had in mind?



*"We shall require a substantially new manner of thinking if mankind is to survive."*

**Albert Einstein**



## Notes on Loop Pages

So, how would you... Yarmolinsky and Foster p. 3-4

Why is it harder ...Yarmolinsky and Foster p. 3-4

What might happen in case of an escalation of alerts? Ford, p. 49

What are U.S. Submarines Ford, p.120

What is the purpose of "tactical" nuclear weapons in Europe? Kull 42-43  
and Jervis, p. \_\_\_\_

Why do we hear both that nuclear war can be won and that it cannot be won? Kull p. 47

Why do both sides sometimes say that nuclear war can be won? Kull p. 49-50

What is the Mutual Assured Destruction Policy? Ikle, p. 130

Should we create the perception that a small nuclear war could be fought and won? Kull p. 38

How do we get them to believe that we are stronger than they are? Kull, p. 44-45

Does the perception of why we should build more weapons make a difference? Kull p. 49

Do we need an exact balance of strategic nuclear forces? Kull p. 36

Poseidon Submarine. Carter quoted in Kahn, p.101

von Hippel quoted by Ford, p.41

Why is it always possible to show that we are behind? Kull p. 49

Why don't both countries make no first use pledge? Gompert et al p. 26

How do you tell murder from patriotism? This definition was suggested to me by Gordon Feller (1986)

What is the European (NATO) first use problem? Jervis, p. \_\_\_\_

Can we protect our allies with our nuclear weapons?, Jervis, p. \_\_\_\_

Why do attempts to get an exactly balanced deterrence equilibrium stimulate the arms race? Kolkowicz, p.38

Why to we and they feel continually threatened? Kolkowicz, p.27-28

Why have efforts aimed at avoiding civilian targets destabilized deterrence and increased arms racing? Kolkowicz, p.38

Why would sharp decreases in strategic nuclear forces be destabilizing and thus dangerous? Kolkowicz, p.38-39

Why would it be destabilizing to the present system if we agreed to balance nuclear weapons at a much higher level? Kolkowicz, p.39

Why does it seem like we can't significantly change the cu

rrrent nuclear deterrence system? Kolkowicz, p.39

Why do we say that we think a nuclear war is winnable even though we don't think so? Quester p. 99

Why is it that we can't seem to increase our security by increasing our weapons? This is a version of the "security dilemma" noted by Jervis (1987)p.56. See also Jervise (198\_)p. \_\_\_\_

How do we ensure that we are not fooled by our opponents? This is the self-fulfilling prophecy fallacy.

What effects does a strategy of meeting any threat anywhere have? Jervis (1987) p. 69-70

What makes the condition of deterrence more dangerous? Jervis (1987) p. 74

## Defense

Do we need ballistic missile defense(BMD) to deter counterforce first strikes against our ICBMs? Glaser, p.102-103

Do we need BMD for prompt retaliation against their ICBMs and other time-urgent targets?Glaser, p.103

Do we need BMD to keep our deterrent triad more invulnerable to advances in their forces? Glaser, p.103-104

Do we need BMD to protect command, control, and communications and other military targets? Glaser, p.104-105

Would missile defense support arms control of strategic nuclear weapons? Glaser, p.110-113

Would a missile defense help deter against relatively small and limited nuclear attacks? Glaser, p.106-108

## Notes on Quotes

Epigram Jervis p. \_\_\_\_ Karl von Clausewitz quoted in Kaplan p.79 Lidell Hart quoted in Paulson, p. 18  
Part 1 Epigram Deterrence Epigram Yarmolinsky & Foster p 3-4  
Part 4 Epigram Kissinger quoted in Joseph & Rosenblum p. 127-128.  
Part 6 Epigram Yarmolinsky and Foster p. 3-4  
Part 8 Epigram Kissinger quoted in Jervis p. 92  
Part 9 Epigram Kissinger quote from Years of Upheaval p. 1195  
Part 11 Epigram Conclusions Sauze p. \_\_\_\_ and Freedman p.308  
Why don't we just say Jervis  
Are some kinds of deterrence... Schell p. 65  
The Illusion of Meaningful Action, Kull, p. 51  
The Who's Ahead Perception...Kull p. 28-29  
Mutual Exchange Equals National Suicide, Brodie quoted in Kaplan, p. 191  
Tactical Nuclear Weapons, Nigel Calder Quoted in Schroeder, p. 293  
The Problem with Assured Destruction, Nixon quoted in Schroeder p. 272  
Worst Case Analysis Brooks quoted in Schroeder p. 312  
Credibility, McGwire, in Prins (1984) p. 80-81  
Strategic Superiority, Kissinger quoted in Carroll p. 12  
Chart Total Megatonnage, Harvard, p76  
Chart Total Nuclear Warheads, Harvard p74  
Chart Total Strategic Delivery Vehicles, Harvard, p 75  
What would nuclear war be "about?" Thompson quoted in Schell p. 163  
Turco Quote: Severe Environmental Effects of Nuclear Winter Confirmed  
A statement of Dr. Richard Turco, at the Nuclear Winter Press Briefing, May 28, 1987.  
A statement of Mark. A. Harwell, Cornell University, Nuclear Famine Would Follow Nuclear Autumn or Nuclear Winter, at the Nuclear Winter Press Briefing, May 28, 1987.  
The Perception of Superiority. Bundy quoted from Betts, p. 180  
Actual Uses of Nuclear Weapons, Kennan Quoted in Thompson p. 1; McNamara quoted in Paulson p. 54  
Deterrence as Addictive Behavior. Bateson quoted in Thompson p. 3.  
Assumptions of Deterrence Theory, from Thompson p. 14-15  
Limited Nuclear War, Brown quoted by Kaplan p. 385-386  
Threat, Watzlawick quote p. 107  
Trust is Unreasonable So We Must Do It, Watzlawick, p. 101-102  
Trust, Watzlawick, p. 101  
Serve No Purpose But to Deter Opponent's Use, McNamara quoted in Kolkowicz, p.5  
The Circular Logic of the Arms Race, Kolkowicz, p. 38  
We have no realistic idea how to replace deterrence., Kolkowicz, p. 39  
We may deter ourselves, Colin Gray quoted in Kolkowicz, p. 162  
They can threaten us with a war that we would start, Schelling quoted in Kolkowicz, p. 53-54  
How long can deterrence last? Nye  
Tempted to Search for Ways to Greater Control Over Their Fate. Martin quoted by Gray in Kolkowicz, p.172-173  
Scaring Your Own People Does Not Make a Strategy Popular. Stein in Kolkowicz p. 202  
Perceptions of Tactical Nuclear Defense, Gray quoted in Kolkowicz, p. 173  
Attack Their Command Structure. Scroft Commission Report quoted by Gray in Kolkowicz, p. 165  
Reciprocal Action Which Leads to Extremes. Clausewitz quoted by Gray in Kolkowicz p. 177  
Existential Deterrence. Gray quoted in Kolkowicz p, 162  
The Fog of Foreign Policy Making, Jervis quoted in White p. 129-130  
They May Seek Security Rather Than Be Aggressive, Jervis quoted in White, p. 116  
They seem more aggressive precisely because they are acquiring more capability. Jervis quoted in White p. 113  
You cannot enter into the other man's counter-fear. Butterfield quoted by Jervis in White, p. 113  
The Benign Aspect of Confusion. Betts quoted in Blechman p. 80

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